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CONTENTS

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145 North Tenth Street, Philadelphia

Treat Hay Fever with Suprarenalin

LABORATORY PRODUCTS

Suprarenalin is the remedy in Hay Fever. It may be administered locally, internally or Hypodermatically.

Locally—Solution and ointment are applied to affected parts.

Internally—Solution should be given, so that the patient will get from 1/10 to 1/10 of a grain; the dose repeated in from 10 minutes to 2 hours, according to effects.

(Let the patient hold Suprarenalin in the mouth for awhile, as the best systemic effects are got by absorption through the membranes.)

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Suprarenalin is recommended in Hay Fever in various forms. Herewith are suggestions made by men of authority.

One recommends using solutions of varying strengths from 1:10,000 to 1:1000 made up with normal salt solution. To sustain the relief to some extent, he suggests spraying over the constricted mucous membrane a 5 grain to the ounce solution of menthol in albolene, benzoinol or other light oil.

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   Heavy Magnesium Carbonate .....900 parts
   Mix. Triturate well.

2. Suprarenalin ..... 1 part
   Zinc Oxide .....100 parts
   Bismuth subcarbonate .....400 parts
   Mix. Triturate well.

3. Suprarenal gland substance. 1 part,
   Zinc Stearate ..... 20 parts
   Zinc Oxide ..... 80 parts
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4. Suprarenalin ..... 1 part
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Cocainae hydrochloridi.	15	or grs. iiss
Sodii boratis.....	30	or grs. v—
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Glycerine	2	or ℥ss—
Aqua Camphorae ad.....30		or ℥j

M. Sig. Use as a spray to the nose four or five times daily or oftener if needed.

Suprarenalin Solution 1:1000 (Armour) is stable, uniform, non-irritating and is free from chemical preservatives. *Literature to Physicians.*

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THE AMERICAN
JOURNAL OF PHARMACY

VOL. 93. AUGUST, 1921. NO. 8.

EDITORIAL

THE COMPULSORY ADOPTION OF THE METRIC SYSTEM.

There is a needless hue and cry in the air over the compulsory introduction of the Metric System into general commercial use in this country. A bill known as The Metric Standards Bill has been introduced into Congress which calls for the forced adoption of this system. Provision is made in this bill for the gradual advance to the decimal metric units of weight and measure during a transitional period of ten years. It also enables the manufacturer to choose any weights and measures for use in production, but calls for the exclusive use of the Metric System in commercial transactions. All the organizations in favor of its compulsory adoption have combined forces and under the designation "The World Metric Standardization Council" are conducting a forceful campaign to influence the country at large to accept this system as the recognized standard of weights and measures. This Council has met some bitter opposition from another aggregate of organizations who predict disastrous results to business if the country is to be forcibly made to adopt this Metric System plan. This latter organization is termed "The American Institute of Weights and Measures," and its campaign of education, if it might be so termed, is intensive, expensive, and quite as forcefully conducted as that of its opponents. Both sides marshall an imposing array of arguments and a formidable army of proponents, and, if judgment were to be based purely upon the presentation of the issues by these organizations of *pros* and *cons,* it would be indeed a difficult task to choose sides in the argument.

The multiplicity of arguments with which we have been literally

overwhelmed by both sides in this controversy have almost biased our opinions and we hesitate to offer our judgment at this time, lest it be not candid and lucid. We are tempted, however, to submit in detail some of the demonstrations which both sides have presented to the country in their most recent communications. Pharmacists need to ponder carefully over these various considerations before formulating their judgment. The fact that this system lends itself remarkably well in serving certain phases of our activities and practices must not blind our judgment insofar as to favor its compulsory adoption by all the people and all the industries. The guiding motive of those who seek to offer opinions on this all-important subject must be based on a desire to serve not a single branch of industry or service, but rather with an eye to conveying an improvement that will benefit the great majority of industries and services.

Academicians have been too prone to ridicule the cumbersome old English systems of weights and measures with their alleged ponderous and conflicting units and they have been frequently and properly criticized for having obscured in the ardor of their decimal enthusiasm certain marked advantages which these systems exhibit. We never recall that our metric arithmetic teacher ever pointed out to us the labor saving which results from the use of the dual or duodecimal systems; that five is the only digit under seven which is not divisible into twelve, while two and five are the only two which divide into ten; that ten is not expressible in integral units when divided into quarters or thirds the latter faction running into rows of integers that recur into Einsteinian endlessness. These advantages, of course, are well balanced when the metric simplicity is considered, and our coinage system is proof positive of the ease with which *ten* lends itself to our everyday arithmetical processes.

Rather than elaborate further on the matter the arguments herewith are presented, culled as they are from various sources, in order to afford a résumé of both sides of the question.

Arguments for the Adoption of the Metric System.

Under the metric system only three names are used.

(1) The *meter* and its decimal values for measures of length.
(2) The *litre* and its decimal values for measures of capacity.
(3) The *gram* and its decimal values for measures of weight.

These three units are simply related, *e. g.,* for all practical purposes, 1 cubic decimeter equals 1 litre and 1 litre of water weighs 1 kilogram.

Exclusive use of the metric system is in force in France, Italy, Germany, and thirty-one other countries.

Even the most rabid opponents of the metric system admit that the metric system is simple and easy to use, but they always fall back on their "bugaboo argument" that the compulsory change to metrics will involve tremendous expense in installing new machines, etc.

There is little basis for this contention, and it has been disproved so often by the very men who should know, namely by captains of industy, that we are forced to the conclusion that the opponents of the metric system simply haven't given the matter any thought and are ignorant of the manner in which the metric system can be operated.

There is no need for manufacturers to abandon the standards they now have and to take up others having different dimensions. Actual sizes can be determined accurately by means of the metric micrometer. Only the arithmetical value need be converted.

The United States of America can adopt metric standardization even though avoiding strange names. Old terms of yard, quart and pound can be preserved. English equivalents would do just as well for unfamiliar words in metrics. Why not say world yard for meter, world quart for litre and world pound for 500 grams? This is what they have done in Switzerland. As a result few people know that slight changes have been made in the units to make them metric equivalents. The German "pfund" of tobacco is 500 grams, the "fass" of beer is invoiced by its real contents in litres.

Metric Standardization would entail a negligible cost in changing weights and measures. Readings on expensive scales can be remarked at slight expense.

Arguments Against the Adoption of the Metric System.

Irrespective of any merits the metric system may have, the country, in case the system is made compulsory, will have to face:

(1) A long transition period; as a matter of fact, old units never disappear.

(2) The introduction of a dual system, because the habits of the people cannot be legislated away.

(3) A confusion between the two systems, becoming a most prolific source of error and expense.

(4) A cost appalling in its magnitude represented by the change involved in deciding on new standards, making new drawings, tools, fixtures, etc., which would seriously threaten during the transition period at least, our system of "interchangeabe" parts.

(5) The re-calculation and establishment of new prices for every commodity raised and manufactured to conform with the new standards of length, weight and volume. (New catalogue.)

(6) The re-standarization of the products of industry and the re-writing of practically all our technical literature.

There are many important points raised by both sides, and there is need of careful consideration before formulating a decided opinion on the subject.

I. G.

ORIGINAL PAPERS

THE SIGNIFICANCE OF EDUCATION.

By WILLIAM H. CARPENTER, PH. D.
Provost of Columbia University.

AN ADDRESS DELIVERED AT THE CENTENNIAL EXERCISES OF THE PHILADELPHIA COLLEGE OF PHARMACY AND SCIENCE, TUESDAY, JUNE 14, 1921.

In a search in the Columbia University Library recently for material bearing upon the early history of medical education in New York, we came across a pamphlet containing the address delivered at the Commencement, in 1819, of the College of Physicians and Surgeons, now of Columbia University, at that time under the temporary jurisdiction of the University of the State of New York, by Dr. Samuel Bard, President of the College. Dr. Bard, who was born in your good City of Philadelphia in 1742, had been Professor of the Practice of Medicine in old King's College before the Revolution; he had become in due time the chief practitioner of medicine in the City and Province of New York, and had the distinction of being the family physician of George Washington. The address, which is a truly remarkable one both as a statement and a prophecy, begins

with the following sentence: "A sound mind, in a sound body, constitutes the principal happiness and perfection of man; the means, therefore, by which such great and essential benefits are to be secured, have ever been the object of his solicitude, and most anxious inquiry." The statement, made a hundred years ago, was not new, nor was it in its main thought original. It is in reality but a paraphrase of what the Latin poet, Juvenal, said eighteen hundred years before him in that often quoted Latin phrase: "Mens sana in corpore sano," as constituting the ideal possession of a Roman youth.

The statement has appealed to me for the universality of its application. It would be quite impossible at the present time, or it will be impossible through the long years of history yet to come, to formulate the matter, either in its original epigrammatic form eighteen centuries ago, or in its paraphrase a century ago, as the essential fact in the existence of the individual, both for himself and for the part that he perforce must play in the social complex of his day and generation—for I take it as a self-evident truth that no man stands for himself alone in his out-goings and his in-comings, in his opinions and his prejudices, in his joys and his sorrows, in the manifold actions and reactions of human contact in the relationships of life, and that his mind and his body in their balance are a fundamental fact in the greater balance of the world of men beyond him.

If this fact then remains, as it seems to me to remain almost an eternal verity, that a "sound body" is an essential factor, and let us even say the essential factor of successful living, it is, after all, but a general statement that like such statements elsewhere is in need of what is sometimes called a definition of particulars to make it directly intelligible and applicable to any particular time. In point of fact, it has had at one time a meaning very different from what it has had at another, and while in a broad sense it has been always true, in a narrow sense of the actual accomplishment of result in the light of the understanding of a particular time, it has swayed backward and forward as the ideas of life and living have advanced or retreated on the long highway of human history. What I mean to say is that while the attainment of a sound mind in a sound body has been the educational ideal of the centuries—for it is a true definition of the purpose of education, as it has ever been—the means to attain it and the real results that it has been desired to attain have been as different as has been the whole varying course of human civilization. The serious ideals of one age have been at times the

ridicule of the next, and the little-regarded of one generation have been not seldom advanced by its successors at other times to positions of supreme importance as matters of belief, and it has even gone so far in history that the sins of one generation have been the virtues of the next.

The history of education, accordingly, as I desire to use the term, shows a constantly changing concept, even generation after generation, of the means of attainment and of the actual ultimate result to be attained to accord with the time and place, which shall constitute a man in the eyes of his generation as one with a sound mind in a sound body, or, as we may choose to phrase it, with an education that shall fit him to play his part on its recognized stage of action.

In a recent English essay on the need of educational reform, although in a wholly different connection, I find this matter stated much more clearly and concisely than I have done. "A new age," it says, "postulates a new education," and it is explained that "the traditions which have dominated hitherto must one by one be challenged to render account of themselves; that which is good in them must be conserved and assimilated, that which is effete must be scrapped and rejected." An education, I would add, that does not fit into the life of the time, not necessarily to subordinate itself supinely to it, but at least to recognize in is content and in the organization of its methods the inherent necessities of the day, is useless where it should be most useful as the very foundation of an advancing civilization.

If all these things are true, and I think in the main they are, the thought that readily occurs is what should be the nature and content of education at the present time, and what is its true significance in the life of the individual and in that of the community of which he, whether he will or not, is a constituent and participating part. For my present purposes I shall assume that a system of formal education that has any just claim to recognition as logically conceived and consistently carried out takes due account of a sound mind and a sound body as coincident factors of educational development. One of my colleagues at Columbia University a number of years ago wrote a book with the somewhat amazing title of "Why the Mind has a Body," and he went on to question the rather natural inference that mind and body are, in respect of action, on a footing of equality; in other words, that the temptation lies very near the surface to set up

the claim that every fact which shows the influence of body upon mind can be matched with a fact showing the influence of mind upon body. His ultimate conclusion, however, is that the dependence of mind upon body in the long run is only apparent, and that as an actual fact of existence the mind dominates the body, which is, after all, but the seat of organic life. Whichever is true—and such speculations run far afield—is beyond my present purpose. We must presuppose, I think, that it is an intention of education to secure by its processes the sound body that alone can support in its processes the sound mind, and that the school and the college, however imperfectly the results may actually be attained, are as alive today to the necessity of the correlation as were any of our forbears in the past. I hold no special brief for the particular form which the training of the body should take in the school or the college, since the matter must often be considered from the point of view of opportunity and environment, but that it should have a place, and a well-recognized place, as a fact and factor in any scheme of formal education is beyond argument. What I should have in mind, however, in school and college, is participant athletics—not the kind where the conscientious objectors sit comfortably on the bleachers and let the football team do all the rest. Even the professional school, where notably the work is intensive and the time is short, should find at least a modicum of space for athletic exercise, for a man who goes out to the practice of a profession with an ill-equipped body, however his mind may function, is handicapped from the start.

What, then, from the point of view of the mind—and of the soul—is the real significance of education, at the present time, not only to my generation which began with widely different ideas, and in some respects with very different ideals, from those of today, but to the generation that is now taking possession of the field as our successors in the activities of life; and what shall it be in its character and content to function, as needs must be, as a controlling impulse to lead not only the heads, but the hearts of men? "How can a man," says Carlyle, "without clear vision in his heart, first of all, have any clear vision in his head?" And long before him, it was pointed out that: "As a man thinketh in his heart so is he."

In making any definition of education, or in attempting any predication of its purpose and results, we must, of course, at the beginning fully recognize the fact that in the life of the professional man, the lawyer, the physician, or the pharmacist, there are two

elements involved, his education in his profession, on the one side, and his liberal education, on the other, or what we might properly call, at least from a certain standpoint, his special and his general education. My contention is that not for a moment is there any actual line of demarcation between the two. They are like two states of matter in flux that flow into each other until the whole is permeated by both and a new compound is formed that partakes of the nature of both elements, but yet in the end is neither. The lines of a professional education at the present time in its narrow sense of a special training for the practice of some one of its many phases are as a general thing well laid down, and the professional schools of the country of the best sort are more adequate in their equipment of men and methods and more reasonably sure of the competency of their professional product to understand and to cope with the problems of practice than ever before in our history. This is, however, but one part of the problem of education, for a man, and we must now be careful to say, in her share in the practice of the professions, a woman, who is trained in a profession alone, and no matter what that particular profession may be, is only half educated, for another half essentially important has been neglected. I should greatly doubt, however, when all is said, that any one of the good professional schools now walks consciously into such a slough of despond as to make its courses of instruction purely professional and nothing else, or at least does not base its professional training as a climax of formal education upon a basis of general culture. There are, nevertheless, from the very nature of the case, temptations to do so that must be borne in mind in the organization and conduct of every professional school, whether pharmacy, law, or medicine, or any other, that must be counteracted and discouraged. There is an insistent demand in an age that is distinctly materialistic for material results, and, in the characteristic hurry of the time, for their rapid production, and the young men and young women who are to go out into the world in the practice of a profession for themselves are confronted with a period of preparation, if care is not taken, too prolonged in age and expense to make it possible of accomplishment. These are real difficulties that confront every professional school in the proper carrying out of a scheme of education, and yet they must be rationally met or else that school has only half done its duty to those whom it has stamped with its approval at the end of its teaching. It may be true that the school in question has prepared its

graduates to make a living, which, to be sure, is one of the ends of existence and a very important end indeed, since a good deal depends upon it for the part you play or even whether you are alive or dead, but in the more perfect equipment for life, and that is what we are considering, the fact of merely being able to make a living, although it is essential to most of us, or the acquisition of wealth which is but its sublimation, is but one element and not the only one in the whole plan of existence, for the end of all real education is not to make a living, but to live!

And what about this other half in a scheme of education, concerning which we have been talking with such confidence as an element of human life? A wise man has said that "the aim of education is the knowledge not of facts, but of values," in the sense that "values are facts apprehended in their relation to each other, and to ourselves." The matter could not have been better stated, for it is certain that the mere accumulation of facts, whatsoever kind they may be, does not constitute an education, or knowledge of them an educated man. It plays no part to you or to me as a criterion of education, as it is sometimes made to appear, whether we know any part or all of a long list of what is, after all, but the uncorrelated material of education, and not the thing itself in its relationships and its proper adjustments into a body of knowledge which shall constitute a cultural whole. A man may have read through the whole *Encyclopedia Brittanica* and have remembered its facts, and yet have failed wholly in securing an education in any real sense. Facts are no doubt the basis in essential ways of education. This is particularly true of the strictly professional part of education, where of necessity facts are the very bricks and mortar on which the superstructure of professional knowledge is built, but this presupposes no heterogeneous collection of the odds and ends of knowledge, but of the evaluation of the many facts with which a profession is necessarily concerned in their relation to each other and their fusion together into a connected product of immensely increased importance because of its cumulative force.

As to the true content of what is usually called a liberal education, although only too often it is illiberal in nature and amount, I again hold no specific brief. I have, however, a very definite opinion of what should constitute in the end that education which it is desirable to attain in order to give it its true significance in a scheme of living. Herbert Spencer's famous definition of biological life: "The

continuous adjustment of internal relations to external relations," is much more widely applicable than to the mere functional existence of the body, for it applies alike to the mind and soul of man, and it is the great and transcendent purpose of a true education to awaken the mind and soul and to bring them into harmony and adjustment with the conditions of life.

Education, then, is not mere instruction in the subjects of the school or college curriculum, whatever they may be, science, the classics, mathematics, literature, or history. These in proper balance are no doubt, in some measure or other, the legitimate means to an end, but they are that only in their proper function as factors in a combined result more important than any one of them. And just where the emphasis in subject instruction should lie I do not know, and the schoolmen themselves who are most directly concerned with this phase of formal education are by no means agreed as to what the ultimate worth to a trained mind this or that subject should be. The field is so broad that it is only possible to delimit and choose, but the choice need not necessarily be in every instance the same, and doubtless at the best, and whatever has been chosen, it will only partially accomplish its object. I am not like the Scotchman of ancient memory who was open to conviction, but would like to see the man who could convince him, or the man who liked any color so long as it was red. My own preference would be the classics, for I am old-fashioned, a science, because I believe in the new, English languge and literature, a modicum of mathematics and a good deal of history, but I am open to conviction that that is not the only way to state the case, and that under the special circumstances at hand other subjects, in other proportions, might be selected as well.

The end, however, of a formal education is clear. It is so to train the mind and the soul that there shall be a foundation at least of the true appreciation of the values of the things of life. No one is, of course, educated in school or college, for education never ceases, now or at any time, in the normal existence of the individual. The student in the story that I have always considered somewhat apocryphal who rushed out of his college Commencement waiving his diploma in the air and shouting: "Thank God, I am educated!" was entirely too sanguine of the actual result that had been attained even by a college course. The story does not tell of his future history, but I greatly fear that it was one of disillusionment, for he surely must soon have realized that he was only at the beginning and not the end of an unceasing quest.

It is the province of education to point out the direction of the quest for knowledge and for the truth that ages ago it was said "shall make you free"—free to discriminate between the true and the false wherever they may appear, in the narrower ethics of the practice of a particular profession as well as in the broader affairs of civic and national life; free to discover and to understand the false claims of charlatanism in all phases of life and in whatsoever guise, or disguise, they may clothe themselves for the befoolment of the crowd; free to value at their real worth the passing fads and foibles of the moment that are but the froth borne along on the top of the wave that presently will recede and leave the wider surface unruffled as before; in other words, free to recognize that truth, and truth only, is eternal, and that all else sooner or later in God's good time disappears wholly from the sight of men, that it ultimately vanishes—an intangible shadow without substance or reality—back into the infinite space from which it momentarily has emerged and is forgotten!

There has been no greater need at any time of the educated man, and no time like the present time to keep these things in mind. I have always remembered a phrase used by President Butler in the address delivered at the Columbia Commencement of 1917. At that time, the Great War was still in its throes of death and destruction, but it was pointed out by the speaker that the world was more than a world at war, it was a world in ferment. What he meant was that the political and social conditions that always follow in the wake of war, and as a consequence of it, were like the chemical decomposition of an organic compound, and veritably were in a state of fermentation.

What was said then in the midst of the mighty struggle that was still going on is unfortunately as true today as upon the day on which it was spoken. The world is still in ferment. Old standards of conduct have been obscured, and sometimes forgotten. Old ideas of duty have apparently been laid aside. Old traditions of righteousness have been displaced in high places. New ideas of individualism and self-determination have swept away the multitude, and a new world, in many respects unlike the old, has taken its place. In spite, however, of all that is new and disturbing in conditions of the present which have followed as a natural consequence the destructive forces of the war, destructive to human conditions as well as to human life,

there are still, however, in the new world that has come about, the same fundamental standards of life and living. Whatever has been installed and whatever has been lost, there are still as deeply intrenched as ever the eternal verities that are the basis of human action. Truth may be obscured, but it is not destroyed; honesty may be in eclipse, but it is only hidden; personal conduct that controls the souls of men remains as it ever was, the fundamental fact of human and social existence. However much things seem to be in disorder and standards appear to be destroyed, at the bottom there is still the same basis of human action—action *as* an individual in living his own life for himself, action *in* the individual as he is a constituent and component part of the nation in which he lives. However the world may change, and however it has changed within your memory and mine, this is the fact that must remain still firmly fixed in our minds, that the old rules of conduct in the things of the mind and the soul are still always as they have been, and that these new conditions that confront us are often but the froth of the ferment, and the real, the fundamental facts of existence still remain, and will always remain the same. Life, as we have said, is infinitely more than organic existence. The life of all who are living today to enter into its fullest appreciation is not only the life of the body, but it is the life of the soul of man with its aspirations, its longings for results, its sacrifices and its achievements, and the men and women who go out into this new world from the professional schools to take their place in it should be equipped not only with a knowledge of the profession which they may have chosen for their own, but equipped also, as I think, with a knowledge of the value of the things of life to themselves as individuals, as I have tried to state it, and to the society in which they are to live and to act as its responsible members, and it should not be forgotten that these fundamental things that I have called to mind are the real conditions of a rational existence.

An individualism that thinks only of self and a determination that has only self for its object is, however, but half of the duty of man. A thought of self is necessary for self-preservation as a fundamental fact of existence, but the mind that stops there has only realized a part of the supreme significance of life, which not merely takes account of the individual to himself, but also in a broad and enlightened spirit makes him to himself a constituent and militant part of his environment and of his place in human society. In the background of it all is still, of course, the professional calling of the

individual. A great philosopher, Francis Bacon, three centuries back expressed this matter in terms that cannot be better stated today: "I hold every man a debtor to his profession, from the which, as men of course do seek to receive countenance and profit, so ought they of duty to endeavor themselves . . . to be a help and ornament thereunto." There can be, however, no thought to live for it alone, because, in the end, it is only one of the manifold parts of life.

A real education is more than a special equipment in any single direction of human energy, and its intention is to unfold to its highest potentiality the nature of man. The best definition that I have ever read of the true significance of such an education to the man who wears it as his crown of accomplishment is that contained in Huxley's "Essays," from which I copied it many years ago and have kept in sight as a precious possession. It is only a part of a longer statement of the position of man in the universe and his relation to it, but it bears directly on the present case, and this is what he says:

"That man, I think, has had a liberal education, who has been so trained in youth that his body is the ready servant of his will, and does with ease and pleasure all the work that as a mechanism it is capable of; whose intellect is a clear, cold logic engine, with all its parts of equal strength, and in smooth, working order; ready, like a steam engine, to be turned to any kind of work, and spin the gossamers as well as forge the anchors of the mind; whose mind is stored with a knowledge of great and fundamental truths of nature and of the laws of her operations; one who, no stunted ascetic, is full of life and fire, but whose passions are trained to come to heel by a vigorous will, the servant of a tender conscience; who has learned to love all beauty, whether of nature or of art, to hate all vileness, and to respect others as himself."

Such a man, it seems to me, has realized to the full the significance of education as I have wished it to appear in these somewhat scattered remarks this morning, fitted in his mind and soul to serve at least in partial fulfillment of the purpose of what long ago was called "the great appetites of honor."

ECONOMY OF TIME IN PERCOLATION.

By Dr. Robert A. Hatcher.

(*With Technical Assistance of Miss Anna Lichtman.*)

The Pharmacopœia directs that when an official tincture is to be made by percolation the moistened drug shall be allowed to stand during a period of six hours before it is packed in the percolator, and that when the liquid begins to drop from the lower orifice of the percolator, the drug shall be allowed to macerate during a period of twenty-four hours before the percolation is allowed to proceed.

It is desirable that the moistened drug shall not stand for a longer period than is necessary for the menstruum to penertate thoroughly into the cells before being packed in the percolator, and that maceration shall not then continue unless it is necessary for the extraction of the active principles, otherwise time is wasted and alcohol is lost by evaporation. Furthermore, the longer the time consumed in making tinctures the greater is the investment in apparatus and floor space required for a given number of operations when these are sufficiently numerous to demand that several shall be conducted simultaneously. This is a matter of importance to large manufacturing pharmaceutical establishments.

It is probable that the period of six hours during which the moistened powder stands before being packed in the percolator suffices for the penetration of the menstruum into the cells of the drug; if this is not the case the fact should be determined by experiment, and a greater amount of menstruum should be used for moistening the powder, or it should be allowed to stand for a longer period of time before it is packed in the percolator.

Nux vomica, strophanthus, and aconite powders in portions of 100 grammes each were used in the experiments designed to show whether it is necessary to macerate the powder after the liquid begins to drop from the percolator in the preparation of the official tinctures of these drugs.

The percolation of the nux vomica was allowed to proceed (without this period of maceration) until 1000 cc. of percolate were obtained, and the marc was then percolated with a portion of the same menstruum until 500 cc. of weak percolate were obtained. The activity of the tincture and that of the weak percolate were then de-

termined by means of the biologic test on frogs. The protocol of the experiment (in brief) which follows shows the tincture represented the drug almost completely, and that the activity of the weak percolate was equal to only about 1 per cent. of that of the tincture.

PROTOCOL (IN BRIEF).

One hundred grammes of nux vomica in No. 60 powder were moistened with menstruum consisting of a mixture of three volumes of alcohol and one volume of water; the moistened drug was transferred to a percolator and allowed to stand three hours (instead of six hours, as directed by the Pharmacopœia), after which it was packed firmly, menstruum was added and percolation was allowed to proceed at once until a total of 1000 cc. of percolate was obtained in a period of forty-four hours. Percolation of the marc was continued until 500 cc. of weak percolate were obtained.

The activity of the tincture and that of the weak percolate were estimated by determining the amounts required to kill a given weight of frogs after injection into the lymph sac. The tests showed that 1000 cc. of the tincture would suffice to kill about 400 kilos of frogs, and that the weak percolate would suffice to kill about 2.5 kilos. This shows that the activity of the weak percolate was less than 1 per cent. of that of the tincture.[1]

The results of this experiment show that it is not necessary to macerate nux vomica after the liquid begins to drop from the percolator in order to insure the practically complete exhaustion of the drug when making the official tincture, provided the moistened powder has been allowed to stand for a period of several hours before being packed in the percolator.

It seemed desirable to compare the activity of the first portion of percolate and that of the finished tincture made in the manner just described with the activity of the weak percolate, hence the procedure was modified in the preparation of the tinctures of strophanthus and aconite. A portion of 250 cc. of the first percolate of each of these was put aside, and percolation was allowed to proceed

[1] Frogs usually require about 5.5 mg. of strychnin sulpate per kg. of weight to cause death when the poison is injected into the lymph sac in solution containing 1 part of the poison to 1000 parts of normal salt solution. Some lots of frogs show closely concordant results, whereas others show greater individual differences. The results in this experiment were not exactly uniform, but the agreement was sufficiently close for the purposes of this investigation.

until 750 cc. of additional percolate were obtained in each case, after which the marc was percolated with a fresh portion of the official menstruum, and this weak percolate was put aside. The activity of each of the several portions of percolate was then estimated by means of the biologic test on cats. The protocol (in brief) of an experiment with each of these two drugs follows.

Strophanthus.—One hundred grammes of strophanthus in No. 60 powder were packed in a percolator, this was percolated with purified petroleum benzin to remove fat, the defatted powder (weighing 74 grammes), was then moistened with alcohol and allowed to stand two hours (instead of six hours), after which it was packed firmly in a conical percolator, alcohol was added and percolation was allowed to proceed at once. The first portion of 250 cc. of percolate was obtained in a period of about twenty-one hours, and the second portion of 750 cc. in the succeeding period of twenty-nine hours. Percolation of the marc was continued until 250 cc. of weak percolate were obtained.

The activity of the several portions was estimated by the method described by Hatcher and Brody. (AM. J. PHARM., 1910, Vol. 82, p. 360) The activity of the first portion of 250 cc. was equal to about 17,780 cat units (this amount would suffice to kill 17,780 kilos of cats with intravenous injection); the activity of the second portion of 750 cc. was about equal to that of the first portion of 250 cc. (the total activity of the mixed first and second portions being about 35,000 cat units); the activity of the weak percolate was equal to about 926 cat units.

These results indicate that the first portion of only 250 cc. contained about half of the total of the active principles of the seed, that the second portion of 750 cc. contained rather less than half, and that the 250 cc. of weak percolate contained about 2.5 per cent. of the total active principles.

Aconite.—One hundred grammes of powdered aconite[2] were moistened with menstruum consisting of a mixture of three volumes of water and seven volumes of alcohol, and allowed to stand during a period of two hours, after which it was packed in a percolator,

[2] The powder used in this experiment was obtained from a reputable firm and was labeled No. 60 powder, but was evidently about No. 80 powder.

menstruum was added and after thirty-two minutes the liquid began to drop from the lower orifice of the percolator, but percolation proceeded so slowly that suction was applied, and 250 cc. of percolate were obtained in fifteen hours—the last 64 cc. of this in twenty-one minutes—and this portion was set aside. Percolation was continued and the second portion, measuring 750 cc. was obtained in the next period of about seventy-two hours. Menstruum was added to the marc and 250 cc. of weak percolate were obtained.

The activity of the several portions of the percolate were estimated by determining the amounts required by intravenous injection to kill a given weight of cats. The test showed that the first portion of 250 cc. of percolate would suffice to kill about 2000 kilos of cats, that the second portion of 750 cc. would suffice to kill about 300 kilos, and that the weak percolate would suffice to kill only about 20 kilos, or less than 1 per cent. of the total of the first and second portions.

DISCUSSION.

The results obtained with tincture of nux vomica and tincture of aconite speak for themselves and do not require detailed discussion, but it is interesting to observe that the first portion of 250 cc. of percolate obtained from the aconite in a period of fifteen hours—without previous maceration, except for the two hours during which the moistened drug was allowed to stand before being packed—was about eighteen times as active as an equal volume of the last portion of 750 cc. which was obtained by percolation during a period of seventy-two hours.

One may be disposed to argue that the failure to exhaust the powdered strophanthus completely affords evidence for the need of the preliminary maceration directed by the Pharmacopœia. Against this is the fact that a given volume of the first portion of the percolate was about three times as active as an equal volume of the second portion. The explanation of the failure to exhaust the drug completely in this case is to be sought in the physical properties of the drug and its active principle.[3]

The cells of vegetable drugs afford extensive surface areas which, by virtue of their capacity for adsorption, retain traces of many active principles with extraordinary tenacity, and in such cases the exhaustion of the drug is dependent upon the character of the solvent and the volume employed to a much greater degree than

upon the duration of the period of contact of the menstruum with the drug. Evidence in support of this is afforded by the results of an experiment carried out in this laboratory some years ago. One thousand grammes of powdered digitalis were percolated with ten liters of the menstruum directed by the U. S. Ph., VIII, during a period of about three months with periods of maceration. The last portion of about 3000 cc. of percolate represented the activity of about two grammes of the powder.

It is difficult to understand what advantage can result from the maceration of the drug for a period of twenty-four hours after the menstruum begins to drop from the percolator if the menstruum had penetrated thoroughly into the cells of the drug previous to its being packed tightly into the percolator. The higher the percentage of the active principles present in the drug the more rapidly will they pass into solution in the menstruum up to the point of saturation, and conversely, the lower the percentage present the more slowly will they pass into solution.

From this it follows that if maceration is required at any time (after the preliminary period before the drug is packed) it will be toward the end of the percolation when the powder is nearly exhausted. If percolation is not too rapid the drug will be practically exhausted by a suitable menstruum without this period of maceration.

SUMMARY.

Tinctures of aconite, nux vomica and strophanthus were prepared without macerating the drugs after the liquid began to drop from the percolator.

The tinctures prepared in this way represent the activity of the drug almost completely.

The first portion of the percolate is much more active than the last portion; the first portion of the percolate of aconite was at least eighteen times as active as the last portion.

[3] There is some evidence that alcohol is not the best menstruum for making tincture of strophanthus. A tincture of strophanthus was prepared with a menstruum of 65 per cent. alcohol in this laboratory several years ago, at which time the several fractions of the percolate were tested for their activity. It was found that the first portion of percolate, representing one-tenth of the volume of the finished tincture, contained 65 per cent. of the active principles, and the second portion of equal volume contained more than 75 per cent. of the balance, the remainder of the percolate containing about 10 per cent.

Adsorption by the cells of the drug plays a variable role in the exhaustion of drugs, certain active principles being retained in the marc with great tenacity. The effectiveness with which active principles are retained by reason of adsorption depends more upon the solvent used than upon the length of time during which the menstruum is in contact with the drug beyond that required for ordinary slow percolation.

Maceration of the drug for a period of twenty-four hours after the liquid begins to drop from the percolator and before percolation is allowed to proceed is unnecessary, and results in loss of time, in the manufacture of tinctures.

Biologic tests were made to determine the activity of the several fractions of percolate.

THE STATUS OF PREREQUISITE LAWS AND PHARMACEUTICAL LICENSURE.*

By J. W. ENGLAND.

The enactment of the prerequisite law of the State of New York effective as of January 1, 1905, and of the State of Pennsylvania effective as of January 1, 1906, affecting the two most populous States of the Union, marks an epoch in the history of pharmaceutical education and legislation in this country. The surprising feature of this legislation, however, is that the importance of systematized pharmaceutical education as a prerequisite for examination to practice was not legally recognized for nearly one hundred years after the establishment of pharmaceutical education in this country by the Philadelphia College of Pharmacy in February 23, 1821.

H. C. Christensen, Secretary of the National Association of Boards of Pharmacy, writes me (May 9, 1921) as follows:

"After the enactment of the prerequisite laws in New York and Pennsylvania, there followed a long period of inactivity along this line, or possibly more correctly a period of propaganda without apparent results until 1915, when the North Dakota and State of Washington Boards of Pharmacy adopted prerequisite requirements

*Read at annual meeting of Pennsylvania Pharmaceutical Association, June, 1921.

by rulings of the Boards. Illinois and Ohio followed with prerequisite laws becoming effective July 1, 1917.

"The seventeen States, including those mentioned above, in which prerequisite legislation has been enacted up to January 1st of this year, are as follows:

New York	Kentucky	Rhode Island
Pennsylvania	Maryland	South Carolina
Illinois	Minnesota	Virginia
Ohio	New Jersey	Washington
Indiana	North Dakota.	Mississippi
Iowa	Oklahoma	

"Oregon has a requirement for one year college work, effective 1921, and graduation effective 1922.

"The five States which have reported that prerequisite legislation has been passed so far this year are West Virginia, by ruling of the Board, North Carolina, Kansas, Nebraska and Texas. Prerequisite legislation is pending in several other States where legislatures are still in session. Alabama, Michigan, Georgia, and a number of other States where conditions were not favorable this year will seek prerequisite legislation in 1923."

By these data, it will be seen that less than one-half of the States of the Union have prerequisite laws, and earnest and determined steps should be taken by the pharmacists of every State not having a prerequisite law to secure the enactment of such legislation, not only for the good of American Pharmacy, but what is more important, the better service of the American people.

Almost as important as prerequisite legislation, is the matter of reciprocity in pharmaceutical licensure and on this question Mr. Christensen writes me:

"Reciprocity in pharmaceutical licensure is in force between forty-three States and the District of Columbia—the list given at the bottom of this page.[1]

"The procedure for reciprocity is by agreement between the State Boards of Pharmacy of the various States using this office as

[1] Active member States between which reciprocity is in force: Alabama, Arizona, Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin.

a clearing house. The applicant for reciprocity secures the official reciprocal application blank from this office on payment of the required fee of $15 (which fee goes for the up-keep of the National Association of Boards of Pharmacy and the bringing-about of uniformity in examination methods, etc., in the various States). Certification as to registration and grades must be made on this blank by the Secretary of the State Board of Pharmacy in the State where he is registered by examination. The application then goes to the Secretary of the State where registration is desired, with the required amount of State registration fee.

"By agreement between the various Boards of Pharmacy certain minimum requirements were adopted at the time of the organization of the National Association of Boards of Pharmacy with reference to standards, etc., which a State Board of Pharmacy must come up to in order to have their licentiate recognized in other States. Since these minimum requirements were adopted, the Association has endeavored to consistently advance the standards in the various States from time to time, and an applicant for reciprocity must meet these higher standards, providing he was registered since they went into effect. This plan of reciprocity is working out very satisfactorily, both with reference to accommodating those who wish to go from one State to another, and also tends to raise the standards of all States, since those States lagging behind lose the benefits of reciprocity for their recent licentiates."

In this connection, Lucius L. Walton, Secretary of the Pennsylvania State Board of Pharmacy, writes me (May 2, 1921) as follows:

"In the list of active member States between which reciprocity is in force, the reciprocity exists between them in so far as the laws of the respective States will permit. In addition to this list is New York as an associate member, approving and supporting the organization, but holding aloof from participating in the reciprocal methods of the Association.

"The affiliated active list gives evidence of the general approval of the organization by the Boards of Pharmacy of nearly all of the States. The attendance upon the annual meetings of the National Association of the Boards of Pharmacy gives evidence of the interest and desire upon the part of at least 60 per cent. of the boards to perfect the organization and bring about uniform requirements and methods for determining the same.

"At the meeting of the Second District of the Boards held in Atlantic City last November, the New York delegation agreed to propose that reciprocity be adopted by the Board of Regents of the State of New York, based upon the qualifications of the individual

applicants.[2] This is really what we do in Pennsylvania. Originally the prerequisite provision of State laws were so drawn that there could be no reciprocity unless the participating States had the same legal requirements for registration.

"The National Association of Boards of Pharmacy represents the State Boards of forty-three States and the District of Columbia; it does not represent California, New Jersey, Rhode Island and Wyoming, while New York has only associate membership.

"Our national organization cannot compel any State Board to make a reciprocal registration if it does not want to make it. It represents the consensus of opinions of its constituent members on all questions relating to requirements and examination methods through its constitution and by-laws, which the members are expected to cooperate in making effective, except when the law of some State prevents."

The National Association of Boards of Pharmacy was organized in Kansas City, Missouri, in September, 1904, in accordance with a resolution passed by the Mackinac meeting of the American Pharmaceutical Association in 1903.

By these facts, it will be seen that the National Association of Boards of Pharmacy has contributed more probably to the advancement of the legal standards of pharmacy than any other single agency. In later years it has had the co-operation of the American Conference of Pharmaceutical Faculties (organized in 1900), which has done much to aid the organization in its work for the legal betterment of the practice of pharmacy.

Pharmaceutical education and legislation should go hand in hand, to the end that the interests of pharmaceutical education may be promoted, pharmaceutical legislation made more effective, and public service improved.

[2] Warren L. Bradt, Secretary of the New York State Board of Pharmacy, writes me as follows: "Replying to your letter of May 25, I am advising you that no action has been taken by this Board recommending to the Board of Regents reciprocity of licenses with any other State Board."—J. W. E.

BLOOD COAGULANTS.*

By Louis Gershenfeld, Ph. M., B. Sc.,

Professor of Bacteriology and Hygiene, Philadelphia College of Pharmacy and Science.

Blood Coagulants may be divided into two classes: (a) Non-specific, and (b) Specific types. Under the first class are included the metallic salts and others which act by directly precipitating proteins. They are more frequently known as Hemostatics. One can readily see that the latter can only be employed in accessible hemorrhages. It is impossible to employ them in inaccessable hemorrhages as death would result when such substance would be injected into the blood stream.

The so-called Specific Blood Coagulants are of recent origin, and their introduction are as a result of a more thorough understanding of the theory of the Coagulation of Blood, which at one time was thought to be nothing more than a reaction between a so-called Fibrin Ferment on the protein material in blood (Fibrinogen) with the production of fibrin and the typical blood clot.

The writer thinks that pharmacists should know more about these products, as they may have occasion to dispense some of them.

An intelligent understanding at such occasion may result in a complete satisfaction to all concerned.

The first of these products employed extensively was Normal Blood Serum.

Normal Serum from humans, but usually from different animals (especially the horse), though not a specific immunity product has been employed in the treatment of hemorrhage to increase the coagubality of the blood.

The serum is usually obtained from a normal animal under sterile precautions. The product is passed through a Berkefeld filter, sterility and toxicity tests are performed, and it is then marketed in sterile containers.

The principle of its action when employed (as it may be locally or in doses of from 10 to 30 cc. subcutaneously, intramuscularly or in critical cases intravenously) is as follows:

* Read before a meeting of the Penna. Pharm. Assoc., June, 1921.

The clotting of blood is not as simple an operation as it ordinarily seems. A substance exists in the blood stream, which is known as prothrombin. The latter reacts with the calcium salts to form an enzyme known as THROMBIN OR THE SO-CALLED FIBRIN FERMENT. During bleeding, the fibrin ferment (which does not seem to be a ferment at all) acts at once on the fibrinogen (a protein material normally present in blood plasma) to form an insoluble substance known as FIBRIN. This forms in shreds within which are held the elements of the blood, this mass in turn giving rise to what is commonly termed a blood clot.

If this theory would be accepted as it stands, the question may arise why blood does not clot spontaneously in the tissues.

Howell (*American Jour. Phys.*, 29, 187, 1911) has advanced a modification of this theory, which is as fully and firmly founded as any theory as yet brought forth. He claims that in addition to fibrinogen, prothrombin and calcium salts, normal blood contains another constant element which he calls antithrombin. The latter possesses the property of preventing the changing of prothrombin into thrombin in the circulating blood. During bleeding, however, the broken down blood cells (especially blood platelets) or tissue cells seem to furnish a substance (called THROMBO PLASTIC SUBSTANCE OR THROMBOPLASTIN), which unites with, neutralizes or inactivates the Antithrombin thus liberating the prothrombin. The latter in the presence of the calcium salts forms thrombin which reacts with fibrinogen, producing the blood clot.

In many cases of all types of hemorrhage, an individual may bleed to death due to a defective power of coagulation. Lack of coagulating properties may be due to many reasons, the important one being, a deficiency in prothrombin (due to its absence or on account of its complete neutralization by antithrombin). The principle of the normal serum treatment consists in supplying the active ferment (present in the latter) to such patients, lacking the active coagulating principle, or as thought by some, its value may be due to the presence of thromboplastic substance.

Horse serum loses its efficiency upon standing. It was also found to be harmful at times due to pronounced anaphylatic reactions, which may result in severe shock and even terminate fatally.

Investigators were therefore let to isolate the clotting principle or produce a substance which would assist in coagulation.

As soon as Howell put forth his theory, a new thought was ad-

vanced for the lack of normal coagulating properties. It was suggested that an insufficient production of Thromboplastic substances may also retard coagulation, inasmuch as only a portion of the antithrombin would only be acted upon. This would still leave some of the prothrombin intact, and only the released prothrombin would be capable of exerting the coagulating effect, which would undoubtedly be diminished.

Howell upon further investigation showed that this "thromboplastic substance" or "thromboplastin" contains a phosphorized fat known as "Kephalin," or "Cephalin," and that the latter was the actual substance of the Thromboplastin which influenced coagulation.

Kephalin, a fat containing phosphorous (called a phosphorized fat) is also an important constituent in nervous tissue (especially brain and spinal cord) and present in larger quantities here than in any other tissue.

Preparations containing Kephalin, the underlying principle of Thromboplastin were soon prepared from ether extractions of the brain and spinal cords of mammals (sheep, of cattle, etc.). These products alone, or admixed with normal serum or extracts from normal serum or dried blood and blood platelets are marketed as efficient blood coagulants under various names as:

Brain Lipoid, Solution of Brain Extract, Thromboplastin, Hemoplastin, Coagulen, and Coagulose.

It is at times impossible to determine just what element is lacking which may result in an increase in the coagulation time of blood in an individual. Such a defect must be remedied if the patient is to undergo surgical operation, etc. In some instances it may be due to a deficiency of calcium. This can be easily remedied by administering calcium salts.

At times there may be a deficiency of prothrombin while the Kephalin products are useful in supplying thromboplastin which may be lacking in other instances.

These specific Blood Coagulants are employed hypodermatically, intravenously, etc., for the treatment of inaccessible hemorrhages, and by local application in accessible hemorrhages. They have been employed with considerable success in many cases, but as yet as far from a true specific in the treatment of all causes of hemorrhages, accessible or inaccessible.

Their use is not as extensive as might be due to the fact that

there has not been introduced as yet an efficient method for standardizing them.

These preparations are standardized by different methods, in many instances, each manufacturer using a supposedly pet method supplied by their own laboratories. It would be advisable to adopt a uniform method for standardizing these products which should be approved by the Hygienic Laboratory and recognized in the next revision of the Pharmacopœia (as are other biological assays). The U. S. P. might at the same time include a method or procedure for making an efficient specific blood coagulant.

CONSTRUCTIVE PUBLIC SERVICE IN PHARMACY.

By Charles H. LaWall, Ph.M.

Address Delivered at the Centennial Celebration, Tuesday, June 14, 1921.

During the several thousand years through which the profession of pharmacy may be historically traced, it has undergone many interesting changes and vicissitudes. Its evolution has been irregular and in some respects disappointing. The reason for this is found in its lack of uniformity. It has always been heterogeneous, and its heterogeneity has been variable.

The physician-pharmacist was successively replaced by the alchemist-pharmacist, the grocer-pharmacist, the chemist-pharmacist, and later by the merchant-pharmacist. Through all these metamorphoses there has, however, remained a distinctiveness of service which has been obscured at times, but which in its fundamentals has retained one important phase of public contact and service—the preparation and sale of medicines.

From the most primitive beginnings, in which mysticism and credulity prevailed, and in which empiricism held full sway, down to the present time, when a highly specialized technical and scientific training is required by the State for the protection of the public which pharmacy serves, the dominating purpose has been to assemble, identify, select, preserve, prepare and standardize remedial substances, which in the hands of the careless or unskilled might prove detrimental instead of beneficial.

The history of this famous art is a fascinating chapter of human

progress and endeavor. It has its roots in the misty ages of the Orient and among the races of mankind contributing to its improvement were the Babylonians, Egyptians, Greeks, Romans and Arabians.

Differing in detail as to its practical application, the landmarks are shared by its practitioners in all lands and under various designations. Every civilized country has its pharmacopœia, the *vade mecum* of the pharmacist, and largely the result of his labors and researches. The United States Pharmacopœia, now undergoing its tenth decennial revision, is the second oldest of these national authorities (the *Codex Medicamentarius* of France being the oldest), and in its technical details is a monument to American Pharmacy, which has largely been entrusted with its preparation.

Pharmaceutical education was inaugurated in America by the apothecaries of the City of Brotherly Love when they founded the Philadelphia College of Pharmacy, one hundred years ago. Since that time it has undergone many improvements and changes, as have all other fields of education, but its progress has been retarded largely because of the lack of supporting legislation in many of our States. After many years of waiting we may say with confidence that pharmacy is now on the verge of a great advance in this respect and that in the next ten years more progress will be made than has taken place in the last half century.

There has been no lack of appreciation of what has been needed, but there have been certain forces to combat and prejudices to overcome and much preparatory work to be done. In this connection, credit must be given to the constructive efforts of the American Conference of Pharmaceutical Faculties, composed of representatives of over forty leading colleges of pharmacy of the United States, which has labored unceasingly for twenty years for the adoption of higher standards and the elimination of schools operated for profit alone and not for service to the community.

There has been no failure on the part of the colleges, meanwhile, to educate the students to properly qualify under the State registration laws. The shortcomings have been in not recognizing the necessity of a broader cultural education to accompany the scientific and technical training. The pharmacist of a decade hence will be on a par as regards his preliminary education and cultural training, with the members of other learned professions and insensibly and auto-

matically many of the inconsistencies and evils of the present practice will disappear for all time.

More and more pharmacists each year are fitting themselves for wider public service by taking special courses in bacteriology, clinical chemistry, technical analysis, and sanitation, and are becoming valuable aids in public health work and analysts and experts in their respective communities. The stimulation in this direction has been especially noticeable since the close of the war, for it was during that period that many came to realize the value of scientific training and the opportunities which are open to one who qualifies along such cognate lines of study.

The interdependence of pharmacy and medicine was never more in evidence than at present, for with the introduction of biological preparations, including sera and vaccines, and the discovery of new methods of preparing and standardizing long used drugs, the physician is more than ever compelled to rely upon pharmacy for distinctive and important scientific assistance. Pharmacy and medicine have common battles to fight in combating the manufacture and sale of worthless nostrums, and in educating the public along correct scientific lines of hygiene and health conservation.

They are co-sharers, under the law, of certain compelling responsibilities which have to do with the control, regulation and distribution of drugs which are known to be habit-forming, and of alcoholic preparations. It is a gratifying fact that the large majority of the members of both professions are true to their trust and worthy of the confidence reposed in them.

The opportunities for advancement, therefore, on the part of a great institution like the Philadelphia College of Pharmacy and Science, which serves pharmacy primarily and medicine indirectly, are convincing in their evident necessity. Among the more important phases of this advanced work are the following:

1. *The conducting of popular scientific lecture courses,* in which the public shall not only be given correct concepts of the scientific facts of importance in connection with pharmacy and the allied sciences, but the combating of error and superstition, which will also be an important part of this constructive work.

2. *The development of research service to the medical profession.* Medicine is already indebted to pharmacy for much con-

structive help in the scientific preparation of effective remedial agents and their standardization, thus allowing uniform results to be obtained under specific conditions. None but physicians and pharmacists realize how much of this work yet remains to be done. The lack of constructive, co-operative work in this direction has been productive of much of the therapeutic nihilism of the recent past.

3. *The institution of research departments which shall aid the manufacturing interests allied to pharmacy.* While a number of the larger pharmaceutical manufacturing establishments have well-equipped and efficient research departments, there are hundreds now without such service. It is to supply this evident need and to supplement existing work that such departments are to be instituted and maintained.

4. *The founding of laboratories for the express purpose of serving the City and State* in an impartial solution of problems such as the quality of supplies, the wholesomeness and purity of foods, the purity of drugs and chemicals, and other scientific questions affecting the public welfare.

These proposed benefits are self-evident. It is of tremendous value to any community to have available a corps of scientific workers capable of helping to solve routine problems. Such an organization in times of stress and emergency, as of war or epidemic, might be invaluable as an insurance against calamity due to lack of scientific preparation.

5. *The development of pure scientific research.* The lessons taught during the World War, as regards the value of pure science, were tremendously convincing. Pure science is only relative. The pure science of today becomes the applied science of tomorrow, and the nation that falls behind in pure scientific research will surely perish, if there ever comes another world war, which God forbid.

6. *The development of a public museum of drug and chemical products and pharmaceutical and chemical manufactures,* which will be distinctive for its breadth and modernity, as well as unique in its exhibits of historic value, for the College collections are especially rich in illustrative material of this kind, which now lack space for exhibition. With our present collection as a nucleus, adequately housed and under efficient full-time curatorship, such a museum could be

made the Mecca for scientific workers in our particular field, as some of our exhibits are very complete and are now frequently consulted by those searching for type specimens, or those illustrative of a certain period.

7. *The creation of a botanical garden particularly devoted to plants of medicinal and economic importance,* in order to stimulate and develop our national resources along new lines and to supply material for medical, chemical and pharmaceutical research.

8. *The proper housing of our present library of more than twenty thousand volumes of scientific works,* frequently consulted by scientists from afar on account of the rarity of some of its volumes.

In partial furtherance of these laudable ambitions there has been planned a series of courses leading to the degree of Bachelor of Science in Pharmacy, in Chemistry, in Bacteriology and in Pharmacognosy. These courses have been outlined and curricula prepared under the approval of the Pennsylvania Department of Education, so that there is a proper balance of cultural and technical subjects, making them equal in this respect to the Bachelor courses of any college of arts and sciences.

These courses will be inaugurated at the beginning of the next scholastic year and have been especially planned so as to cover the subjects required for entrance to the study of medicine. It is believed that they will be particularly acceptable to medical colleges as pre-medical courses, for what better preparation for medicine could there be than a four-year course based upon one of these scientific branches?

A course of fifteen popular lectures upon scientific subjects, to be given by members of the Faculty of the College, has also been planned for the next College year. These include a great variety of timely topics and will doubtless be well attended and much appreciated.

With such a programme of disinterested and constructive public service, we feel that the Philadelphia College of Pharmacy and Science is entitled to the support and approval of the profession which it represents and the community which it serves, and that the close of its second century will find it in the front rank of institutions venerated for their history and acclaimed for their achievements and the excellence of their work.

When we pause to survey the new vista and see the wider horizon, we feel that the measure of our opportunities is well expressed by Rosetti:

"Nay, come up hither, from this wave-washed mound unto the furthest flood brim look with me. Then reach on with thy thought 'till it be drowned; miles and miles further though the last line be, and though thy soul sail leagues and leagues beyond, still leagues beyond those leagues there is more sea."

ABSTRACTED AND REPRINTED ARTICLES

SAL CATHARTICUM AMARUM.*

By William Kirkby, M. Sc.

EPSOM SALT.

There is, perhaps, no more characteristically English medicine than what was known in the eighteenth century as *sal anglicanum* or *sal catharticum anglicanum,* or, in the vernacular, Epsom salts. A quite rare pamphlet gave the first account of the production and properties of this drug. It was written by a physician whose name is best remembered by his work in the field of vegetable and animal anatomy. It is: *"Tractatus de Salis cathartici amari in Aquis Ebeshamensibus et hujusmodi aliis contenti Natura et Usu. Authore, Nehemia Grew, M. D. Utriusque Regiæ Societatis Socio, Londini, 1695."* It is a small duodecimo volume of 96 pages. In Ince's "A Century of Old Books," A. F. Haselden describes a translation of this which was made by Dr. Joseph Bridges, "with animad-versions on a late corrupt Translation by Francis Moult, Chymist, London." I don't happen to possess Bridges' translation, but I do possess, in addition to Grew's original, the translation by the said Francis Moult, although it does not bear his name. It is more interesting as a specimen of smart advertising than for any other reason. The title reads: *"A Treatise of the Nature and Use of the Bitter Purging Salt contain'd in Epsom and such other Waters, by Nehemiah Grew, M. D., Fellow of the College of Physicians and of the Royal Society, London. Printed in the year 1697."*

*Reprinted from the *Pharm. Journ. and Pharm.*, May, 1921.

The translator's "To the Reader" is quite convincing with its air of honest transparency. "The Reason of my publishing this Book in English is, the general Use I observe to be made of the Bitter Purging Salt in this town and elsewhere, by all sorts of Persons, and that promiscuously, in all cases, as People's Fancies or Humours prompt 'em, without any Advice beyond Publick Fame, or the good Woman last visited.

"The Sellers of this Salt are likewise such as use to dispose of other Catholick or Universal Medicines, who neither know how to direct the Buyer, nor care what becomes of the Taker, so as they attain their End, their part of their Profit. There is indeed this difference: That other Medicines that have grown Popular were always usher'd out with printed Directions, or Certificates of its Virtues and numberless cures, as Daffy's Elixir, Spirit of Scurvy-grass, Atkins' Oil for the Gout, etc. Nay, the very Disciples of Ponteus afford for publick Benefit a printed Encomium for a Voucher to the Twelve-Penny Packet. This I thought sufficient to Vindicate my Translation of Dr. Grew's Nature and Use of the Bitter Purging Salt, which I intend to give to those who buy any quantities of the Salt. And I'd have the Reader take notice, That this is no Quack-Bill, no boasting Rhodomontado of any Ignorant Pretender, no guilded Bush to set off bad Wine, but the Observations of an Ingenious Physician, Fellow of both Societies, and published by him in Latin, for the information of the Practicers of Physick, and for no private Interest or Profit. But I can scarce believe the Doctor ever foresaw the Consequence of his Commendations wou'd be the pushing every Body upon the Use of it Hand over Head; therefore I doubt not his Pardon for my Translating it without his Knowledge, my Design being not to discover the Secret Method of its Preparation, but to prevent by these Directions the Mischiefs he tells us may ensue the Abuse of so good a Medicine. Farewell."

The first part of the pamphlet deals with the nature of the salt, and the second part with the use of it. Grew tells us that the Epsom spring was discovered "in or about the year 1620." It seems to have been found a little earlier—namely, in 1618, at least, Thomas Fuller says so—by a farmer called Henry Wicker, who noticed that his cattle refused to drink the water on the land, notwithstanding that it was a dry season, and who on tasting it himself found that it was bitter. For about ten years the water was used by the country people as an external remedy for ulcers, but by the middle of the seventeenth century the Epsom spring had acquired a considerable reputation as a medicinal water for internal use. Grew says that

"the Lord Dudley North, Father to Francis the late Lord-Keeper, labouring under a Melancholy Disposition for which he had formerly Drank the Spaw-Waters in Germany, was resolved to try the Virtue of these Epsom Waters, flattering himself (I suppose) that he had found Chalybeate-Waters at his own Door. However, tho' they answered not his desire and expectation as to their Nature, yet he did not repent of his Experiment, but from that time drank these Purging Waters, as a Medicine sent from Heaven, with abundance of success. Many others, encouraged by his example, try'd the operation of these Waters; and amongst the first, Maria de Medicis, Mother to the Wife of King Charles I., the Right Honourable George Lord Goring, Earl of Norwich, and many other Persons of Quality. These and all others, who drank the Epsom-Waters, came not for pleasure but Health, and therefore always consulted their own, or some Neighbouring Physician, for the Rules they were to observe. In a little while Physicians came of their own accord to these Waters, by whose authority they acquir'd so great a Reputation that 2000 Persons have been there in one Day, to drink or divert themselves.

"About 30 years since, many of the Inhabitants of London, whose Business or Poverty obstructed their going to Epsom, had the Waters sent to them."

Charles II and his Court went to Epsom "to divert" themselves, and later Prince George of Denmark, the Consort of Queen Anne, drove there from Windsor to drink the waters. Pepys, in his diary, has several references to his visits to Epsom. In 1664, we find him recording that "Sir W. Batten did give me three bottles of his Epsom water, which I drank and I found myself mightily cooled with them and refreshed." Three years later Pepys made a Sunday's excursion to the gay town, getting up at 4 A. M. to get ready, and setting out shortly after five o'clock with his wife in a coach and four horses, and provided "with bottles of wine and beer, and some cold fowl." Reaching Epsom at eight o'clock, he went to the well and drank four pints of the water. Then, off to the King's Head, where he hears "that my Lord Buckhurst and Nelly are lodged at the next house. . . . Poor girl! I pity her!" The popularity of the place became very great. Toland, who wrote an account of it at the beginning of the eighteenth century, says that on a Sunday evening he counted sixty coaches in a ring. The New Inn Tavern was thought to be one of the largest in England. At that time the visitors must have

been of a somewhat mixed character, as we are told that one of the elegant amusements consisted in trying to catch a pig by the tail. By this time the mineral water and its virtues had begun to be somewhat of a secondary consideration with those who frequented what had become quite a gay and lively town.

An enterprising apothecary, named Livingstone or Levingstern, realized this fact, and thought he saw a way to make a fortune. He accordingly bought, in 1706, a piece of land about half a mile from the Old Wells, and, having sunk a well, built in connection with it a large house with conveniences for dancing and all kinds of games of chance. He also erected shops for jewelers, milliners, and other trades which appealed to the fashionable folk of the day. Thus, by means of concerts, balls, and facilities for gambling, this apothecary attracted the people from the old well to the new one. Unfortunately, this scheming benefactor overreached himself, and in 1727 he purchased the lease of the old establishment, closed the well and killed the goose that laid the golden eggs, inasmuch as the new well did not possess the cathartic virtues of the old one, and Livingstone discovered that the attractions of his fashionable establishment were really only accessory to the healing qualities of the *sal catharticum.*

Notwithstanding this blow to the prosperity of Epsom determined efforts were made to retain the patronage of the gay and fashionable crowd of London. Some queer expedients were resorted to for doing this, and perhaps one of the strangest was the engagement entered into by the authorities of the town with Mrs. Mapp, the notorious "bone-setter," or "shape mistress," as she was called. This fat, ugly, drunken woman haunted the fairs of the country, and acquired a great name as an expert in the replacing of dislocated limbs, which she appears to have done by reason of her great strength, rather than by dexterity. Her eccentricities added much to her fame, as did also her affected sobriquet of "Crazy Sally of Epsom." Her cures struck the townsfolk of Epsom as being so extraordinary that they though they would be justified in endeavoring to stem the waning fortunes of the town by giving this female quack and ragamuffin a fee of one hundred guineas if she would continue her residence there for one year. She is said to have made twenty guineas a day by her "profession." In the *Gentleman's Magazine* for 1736, we are told that "Mrs. Mapp continues making extraordinary cures." She has "now set up an equipage, and on Sunday waited on

Her Majesty." Her maiden name was Sally Wallin; she married a footman of the name of Mapp, who, within a fortnight, soundly thrashed her two or three times, and then decamped with a hundred guineas and such other portable property as he could lay his hands on. The good lady's success withstood this experience. Once a week she visited London, riding there in her gorgeous chariot, drawn by four horses, and accompanied by servants in splendid liveries. On her return journey she brought with her, as trophies of honor, the crutches of the patients she had cured. Sometime or other it may be convenient to write of the London quacks, and then more may be said about this lady and her crazy career. At the present it will suffice to say that her fame became so great that Hogarth portrayed her evil physiognomy in the centre of the upper portion of the "Undertakers' Arms." A more brutal and sinister face it would be difficult to conceive; it is gross in the extreme, and the repulsiveness of it is heightened by a double squint towards the nose. Her companions in the picture—two equally notorious quacks—John Taylor and Joshua (Spot) Ward, are, by comparison, most humane and benevolent-looking gentlemen.

The account of the pamphlet would not be satisfactory if something further were not said about the *sal catharticum amarum.* Grew took out a patent in 1698 for the preparation of it from the Epsom spring; but, as Grew points out, it was known that other wells, as those of Barnet and Dulwich, yielded aperient waters. In 1700 two chemists, George and Francis Moult, the latter being no doubt the translator of Grew's monograph, found themselves in possession of springs at Shooter's Hill, in Kent, from which they obtained considerable quantities of the purging salt; in fact, in certain seasons they obtained as much as two hundredweights a week. Their success called forth some harsh strictures from Quincy, the compiler of the "Compleat English Dispensatory." In referring to the translator he says: "But the avaricious craft of a certain Furnace-Philosopher could not let this useful discovery in natural knowledge rest under the Improvement and proper Use of Persons of Integrity." Quincy goes on to complain, "that what was first sold for one shilling an ounce, and could not honestly be made under, is now come to be sold for not much above thirty shillings per hundredweight, which does not much exceed three pence per pound." This is apparently where the shoe pinched. He indulged his pessimism too soon, as appears

from what happened about fifty years later (about 1760), when a certain Ingram, a surgeon, advertised real Epsom salts, obtained by evaporating the Epsom water, at as much as five shillings the ounce. How it came about that the Epsom salt came to be confused with the *sal mirabile* of Glauber (*hodie,* Glauber's salts), and how it came to be made from bittern at the salt works of Lymington, near Southampton, and at Newcastle, may be read at considerable length in Dr. James' "New Universal English Dispensatory" or in his "Medicinal Dictionary." The production at Epsom was given up quite early in the eighteenth century. Neumann says he visited Epsom in 1713 and "found no person there who could give any information about the preparation of the salt," and he goes on to say that "I inspissated myself an hundred quarts of the water, but scarcely obtained from them half an ounce of saline matter." The production of Epsom salts from bittern continued until Wm. Henry, of Manchester, took out a patent, in 1816, for the production of it from dolomite.

To return to Grew's tract—the second part deals, as has already been mentioned, with the Use of the Bitter Purging Salt, and in the second chapter is a formula which must be regarded as the parent of *Haustus Niger,* although it is only in the form of a so-called Apozem, and would be taken in rather larger doses than the regulation ℥iss. or ℥ii. The formula reads in the translation:

> Take Spring Water four Pints, Mace a Dram, Senna three Drams, boil them gently and add of the Bitter Purging Salt an Ounce, Flakey-Manna an Ounce and half, or two Ounces, and strain it.

The final chapter deals with the Abuse of Bitter Waters and their Salts.

It might be interesting to compare the work of Nehemiah Grew and Stephen Hales, inasmuch as they both concerned themselves with the anatomy and physiology of plants, and both attempted to find a means of making sea water into fresh water. Grew's publication on "Sea Water made Fresh" appeared in 1684, and went into about ten English editions as well as into French and Italian ones. This anticipated Hales' book by about half a century. Grew's link with pharmacy, however, is his discovery of the purgative salt of the Epsom Spring.

ELDER FLOWERS.*

By E. M. Holmes, F. L. S.

July is the month when the elder is in full blossom, and attention may, I think, be reasonably directed at the present moment to the importance of this abundant shrub for the herb industry. It is surprising how little attention is paid to the cultivation and propagation of this plant in Great Britain, whilst the flowers dried, or salted fresh, as well as dried berries and the juice of the fresh berries are imported by the ton. This may possibly be because the price of Continental produce is less than that of this country. Whether this is due to labor being cheaper abroad, or to the collection of material being facilitated abroad by methods of collection with less expenditure of time and labor, I have at present no evidence. I have, however, frequently been asked to procure elder flowers salted by the ton, and elderberry juice by the gallon, and dried elderberries and fresh leaves by the hundredweight. Dried elder flowers are, I know, imported by the ton from the Continent, of good color and free from stalks, at half the price that the English-grown flowers cost in this country, although the Continental article has to pay freight in addition to the cost of collection.

The question therefore arises whether anything can be done to lower the price of the English produce so as to enabe it to compete with the foreign article. I venture to offer (for the consideration of the Royal Agricultural Society) some suggestions with this point in view. The elder tree, which is allowed to grow in the wild state here and there in hedges all over the country, necessitates a considerable waste of time and labor in going from place to place and in trying to pull down the branches that are out of reach, and there is, therefore, a tendency to pick all the bunches, whether the flowers are fully out or not. This labor and time might be saved by *cultivating the bush as a hedge* around gardens and fields, pruned after fruiting is over down to about six feet, so that the flowers and fruit may be within reach. At present hedges are allowed to be formed of many useless plants, and the space so wasted might be utilized also by forming hedges on chalk or limestone soils of female buckthorn plants, the berries of which there is the same difficulty in collecting. There are other points in connection with the elder to which atten-

*Reprinted from the *Pharm. Journ and Pharm.*, June, 1921.

tion may be directed. The flowers open early in July and last in abundance only for about three weeks, during which time only it pays to collect them. The bunches of flowers do not open all the buds at once, and it needs a little judment to collect those on which the majority of the corollas are expanded, leaving those in bud for a subsequent collection or for forming fruit. When the flower bunches are collected, if placed on the floor in heaps they soon heat and turn black, and care is necessary to spread them out on a *clean* floor, or on trays or shelves, so that the ripe corollas can be easily collected as soon as they fall off, which they easily do when only a very slight heating takes place. The separation can easily be done by the use of a coarse sieve, the bunches with unopened flowers being returned to their places for a second operation. Some buyers like to distil the flowers as soon as gathered for elder-flower water, but for the distillation at more convenient times the flowers are salted, 1 lb. of salt being added to 2 lb. of flowers. For the distillation of essential oil, for which there is a demand for the flavoring of the more delicate white wines, it is absolutely necessary to have no stalks and no flowers that have turned brown, as this spoils the delicacy of the flavor. Clean barrels or other containers are usually supplied by the buyer, as it is not always possible to get them in small country villages. These should be sent about the middle of May whenever salted flowers are wanted, so as to be clean and *ready for use as soon as the flowers are ready*. When the barrels are filled to the top with salt and flowers, no more should be added, but the flowers allowed to sink down, the top tided over with clean Hessian canvas, and labelled "To be kept upright."

With regard to the collection, it must be remembered that at the rate of 1 cwt. per day only 1½ tons can be collected during the month, and a month is practically the limit of time for collection of the flowers. Under present conditions, local advertisement is necessary to ensure a sufficient supply being brought in, accompanied by a printed notice to the effect that flowers turned brownish cannot be accepted. Fresh flowers are sometimes required for immediate distillation. In such cases they should be sent in sacks containing not more than 20 lb., and so loosely packed as to allow freedom from pressure by not tying up the sack too tightly, so as to permit movement of the flowers inside and avoidance of heating, and they should be labelled, "By passenger train, at owner's risk rate. Perishable." Or, by arrangement with the buyer, sacks containing 10 lb. each,

are more likely to arrive in good condition if sent by parcel post, under present conditions.

Elder leaves are best gathered when the green color is fully developed, as they are chiefly used for making green oil ointment, "Ol. Sambuci virid."

Elderberries for drying should be collected as soon as the berries assume a reddish-purple color or they soften too much in drying. The short stalks need sifting out when they are brittle after drying.

For elderberry juice the ripest berries should be used, and to the juice 1 per cent. of formic acid is added. The juice is probably most conveniently obtained in country villages by the use of a cleaned cider press. The juice is chiefly used by wholesale manufacturers of elderberry wine. The formic acid can be got rid of by boiling the juice when required for making the wine.

WHAT IS AN ANTIBODY?*

Within the last few years the words "antigen" and "antibody" have become terms in the vocabulary of practical medicine as well as in the science of immunology. Discussion of the general phenomena of immunity can scarcely be carried on without reference to them. An antigen is a substance which, on introduction into the body in proper amounts and under suitable conditions, induces the formation of a special antagonistic substance, the antibody. At the present moment there are scarcely any well authenticated exceptions to the general rule that every soluble complete protein may serve in at least some degree as an antigen. With respect to the cleavage products of the proteins the evidence of their antigenic properties is at most debatable; certainly none of the amino-acids or simpler polypeptids, *i. e.*, amino-acid complexes, can serve as antigens. The alleged function of lipoids in this role is likewise not established. Karsner and Eckert[1] insist, in fact, that if lipoids are obtained from animal tissues, favorable results may be obtained; but in none of these experiments is it proved that the lipoids are entirely free from proteins. Far less is definitely known with respect to the nature of the manifold anti-

*From *Jour. Amer. Med. Assoc.*, July 16, 1921.

[1] Karsner, H. T., and Ecker, E. E.: The principles of Immunology, Philadelphia, J. B. Lippincott Company, 1921, p. 22.

bodies. Diphtheria antitoxin, which has been studied longest in an intensive manner, has served as the prototype of this class of substances. There has been much evidence to indicate its close relationship or association with certain proteins, notably the globulins of the blood. It is not analogous to enzymes, if one may judge from the failure of antitoxin to be adsorbed by or removed from solution with a variety of indifferent precipitates. The large size or colloid character of the antibody molecule is shown by its comparative non-diffusibility. Recent studies by Huntoon, Masucci and Hannum have helped to narrow the field of investigation somewhat by indicating more clearly than heretofore that antibodies do not belong to that group of proteins usually classed as serum proteins. They showed, as others have previously indicated, that antibodies resist tryptic digestion—a fact which makes them unlike ordinary proteins. Antibodies, furthermore, do not manifest those biochemical reactions and transformations which are at present ascribed to the ill-defined euglobulin and pseudoglobulin fractions of the blood. Being insoluble in ether, they cannot be classed as lipoids or fats. By knowing more precisely what antibodies are not, we may hope to succeed better in the coming years in learning more adequately what they really are.

A NEW METHOD FOR THE DETERMINATION OF CAFFEINE IN TEA AND COFFEE.*

No samples of tea were examined during the past year for inspection purposes, but methods for the determination of caffeine were further studied and the results included in the report of the writer as Referee on tea to the Association of Official Agricultural Chemists at their annual meeting in November, 1920.

The Power and Chestnut method[1] was studied and recommended to the Association as an official method. The Stahlschmit method[2] which is now tentative was further modified[3] so that caffeine residues of a high degree of purity can be obtained. A new proceedure

*From the Connecticut Agricultural Experiment Station Bulletin No. 227, Feb., 1921.

[1] *Jour Am. Chem. Soc.*, 41, 1300.

[2] *Jour. A. O. A. C.* 2, 3, 332.

[3] By C. E. Shepard and the writer.

was also evolved[4], based upon the two methods just mentioned and the Deker[5] method, which has thus far been found to give satisfactory results and which is rapid and simple to manipulate. The two a view to the adoption of one or the other as an optional official method.

The proposed new method is as follows:

Preparation of sample: Grind the tea to pass a 1/25 inch sieve.

Assay: To 5 grams of material in a 500 cc. graduated flask add 10 grams of heavy magnesium oxide and 200 cc. of distilled water. Boil gently over a low flame for two hours using a small bore glass tube 30 inches long as a condenser. Cool, dilute to volume and filter through a dry paper. Take an aliquot of 300 cc., equivalent to 3 grams of original material in an Erlenmeyer flask of 1,000 cc. capacity, add 10 cc. of a 10 per cent. solution of sulphuric acid and evaporate by gentle boiling until the volume is reduced to about 100 cc. Filter into a separatory funnel washing the flask with small portions of 1 per cent. sulphuric acid and shake out six times with chloroform using 25, 20, 15, 10, 10, 10 cc. portions. Treat the combined extracts with 5 cc. of a 1 per cent. solution of potassium hydroxide. When the liquids have completely separated draw off the chloroform layer into a suitable flask or beaker. Wash the alkaline solution in the separatory with two portions of chloroform of 10 cc. each and unite the washings with the main bulk of extract. Evaporate or distill off the chloroform to small bulk, transfer to a tared flask, evaporate to dryness, and further dry in a water oven at 100° C. to constant weight.

If desired, transfer the residue thus obtained to a digestion flask with successive small portions of sulphuric acid and determine nitrogen by the Kjeldahl method, calculating caffeine from nitrogen by the factor 3.464.

The results obtained by the several methods are given in Table XIII.

[4] By R. E. Andrew and the writer.
[5] Chem. Zentr. 1, 1, 62, 1903.

TABLE XIII.—CAFFEINE IN TEA.

	Stahlschmidt Method		*Power and Chestnut Method*		*Proposed Method*	
	By Weight.	*From N.*	*By Weight*	*From N.*	*By Weight.*	*From N.*
	%	%	%	%	%	%
Black tea, 4	2.83	2.81	3.06	2.99	2.98	2.86
	2.89	2.87	3.05	3.03	2.94	2.87
	2.86	2.84	3.05	2.95	2.92	2.82
	....	....	....	....	2.80[1]	2.80[1]
	....	....	....	....	2.84[1]	2.80[1]
Green tea, 5	1.64	1.63	1.61	1.55	1.70	1.61
	1.65	1.59	1.69	1.60	1.66	1.58
	....	....	....	....	1.77	1.66
	....	....	....	....	1.57[1]	1.52[1]
	....	....	....	....	1.62[1]	1.57[1]
Green tea, 9	2.09[2]	1.94	2.12	2.01	2.14	2.08
Black tea, 10	2.71[2]	2.63	2.69	2.67	2.62	2.62
Black tea, 12	3.10[2]	2.96	3.20	3.12	3.00	2.93
	....	....	....	....	3.15	3.03
	....	....	....	....	3.12	2.99

Satisfactory methods[3] have been worked out for caffeine in coffee but we have been interested to try the proposed method on that substance. In two samples tried we have obtained the following results:

Sample No.	*Power and Chestnut Method.*		*Proposed Method.*	
	By Weight.	*From N.*	*By Weight.*	*From N.*
	%	%	%	%
15409	1.51	1.47	....	....
	1.49	1.45	1.61	1.49
15410	0.21	0.17	....	....
	0.21	0.18	0.28	0.24

Sample 15410 was a decaffeinated product. The results suggest that the method is probably applicable also to coffee.

[1] Results by H. A. Lepper.

[2] Not purified by treatment with potassium hydroxide.

[3] H. A. Lepper, A. O. A. C. Referee on Coffee, Report of 1920.

SCIENTIFIC AND TECHNICAL ABSTRACTS

A NEW DIGITALIS BODY.—From experiments performed on cats, using the Hatcher digitalis-ouabain method, it is assumed that there is present in digitalis leaf a substance having a characteristic digitalis-like action, but the effect of which is extremely fleeting. This assumption is deduced from the fact that it requires a much smaller amount of a digitalis preparation per kg. body weight to produce death, injected intravenously into cats during the passage of a few minutes than when the injection is carried out over a period of hours. In the case of digitoxin, the effect is exactly the opposite.

The statement is made that Hatcher has found the same thing to be true of his chloroform soluble fraction of the drug, but in a more pronounced degree.—M. S. Dooley, *Journ. of Pharm. and Exper. Therapeutics,* 17, 277, 1921.

W. J. McG.

CHENOPODIUM AMBROSIOIDES.—The genus *Chenopodium* embraces sixty to eighty widely distributed species, but only two, viz., *C. Quinoa,* Linn., and *C. purpurascens,* Jacq., have attained any importance as food substances. The former produces the starchy quinoa seeds of Chili, and the latter has been cultivated in France for its leaves, which are used as a substitute for spinach. *C. ambrosioides,* Linn., is the only one of medicinal importance. It is probably a native of Mexico, but has spread all over North and South America; it occurs also in Africa, India, etc., in numerous varieties. It has been used for colic and dysentery, but its chief value is as an anthelmintic. Usually the volatile oil distilled from the plant is now employed. It is recommended for cultivation in France and the French Colonies; in the latter case the properties of the drug should be made known to the natives.—A. Chevalier, *Bull. d. Sc. Pharm.,* 28, 129; through *Pharm. Journ. and Pharm.,* June, 1921.

ACTIVE CONSTITUENTS OF SHEPHERD'S PURSE.—The authors have shown that extracts of this drug (*Capsella Bursa-pastoris*) contain a substance which causes a very marked depression of the blood

pressure, and also a product which causes a rise in the blood pressure, and which is carried down by the precipitate when mercuric chloride is added to the extract. The latter substance is probably tyramine, but it could not be identified with certainty. It is very improbable that histamine is present. No evidence of the presence of an alkaloid was obtained. The choline bases were obtained directly by precipitation with alcoholic platinum chloride solution, and the following method of evaluating the extract is based on this observation: Five cc. of the liquid extract (1 in 1) is mixed with 12 cc. of alcohol and 20-25 cc. of 1 per cent. alcoholic solution of platinum chloride. The precipitate is filtered after one or two days, dried, and subsequently extracted on the filter with hot water, the impurities remaining on the filter. The filtrate is evaporated in a tared dish, and if necessary again filtered. A good sample of the drug should yield at least 0.2 gm. of platinum compounds, the purity of which is controlled by observation of the melting point.—Boruttau and Cappenberg, *Arch. Pharm.*, 1921, 259, 33-52; through *Pharm. Journ. and Pharm.*, June, 1921.

Benzyl Esters of the Higher Fatty Acids.—The authors have shown that the benzyl esters of the higher fatty acids may readily be prepared, either by the action of benzyl alcohol on the acid chloride, or by the action of benzyl chloride on the alkali salt of the fatty acid dissolved in excess of the fatty acid. These esters are tasteless and odorless, and have an antispasmodic action. They are more readily hydrolyzed by lipase than are the benzyl esters of the aromatic acids. Bye (*Journ. Ind. Eng. Chem.*, 1921, 13, 217-218) has prepared benzyl succinate by heating succinic acid with benzyl alcohol. It forms snow-white crystals, and is practically non-toxic. This substance may be used medicinally with advantage in any conditions where the use of benzyl benzoate is indicated.—Shoule and Row, *J. Amer. Chem. Soc.*, 1921, 43, 361-365.

A Test for the Adulteration of Olive Oil.—M. Ernest Millieu in a paper presented to the French Academy of Sciences, recommends the following method for detecting the presence of small amounts of cottonseed oil in olive oil. The fatty acids of the oil are separated in the usual manner and dissolved in three times their volume of 90° alcohol. The solution is then placed on a water bath and

1-10 of its volume of 3 per cent. silver nitrate solution is added. After a few minutes' ebullition there will be a black paste-like scum of fatty acids come to the surface, if cottonseed oil is present. This reaction is due to reduction of the nitrate and does not take place with the fatty acids of pure olive oil. With this method 1 per cent. of cottonseed oil in the olive oil can be detected. *Perfumery and Ess. Oil Record.*

THE USE OF EDESTIN IN DETERMINING THE PROTEOLYTIC ACTIVITY OF PEPSIN.—The United States Pharmacopœia method is the only official one in the United States for the assay of pepsin. This method is not proving satisfactory. Edestin, the protein of hempseed, has been used to supply the protein in clinical methods worked out by others for the determination of proteolytic activity, and since it is easily and cheaply prepared the author considers that it may advantageously be used in the assay of commercial pepsin.

Edestin is prepared by extracting nearly fat-free hempseed meal with 5 per cent. sodium chloride solution at 65°. The edestin, which separates on cooling the filtered extract, is recrystallized from the same medium. The nitrogen content of the washed and air-dried edestin is carefully determined, and this multiplied by 5.35 is adopted as giving the percentage of edestin in the preparation. From this the amount of preparation to supply a given amount of edestin is calculated.

For the assay a 1 per cent. solution of edestin in 0.1 N hydrochloric acid is placed in test tubes arranged in a constant temperature bath at 37.5° in increments of 0.25 cc., beginning with 0.25 cc. in tube 1. Tubes 4, 5 and 6 receive 1 cc. To the edestin solution is added 0.1 N hydrochloric acid in decrements of 0.25 cc., beginning with 0.75 cc. in tube 1, thus adjusting the volume in each tube to 1 cc. One cc. of 10 per cent. sodium chloride solution is added to each tube to precipitate the protein. This is followed by the addition of 1 cc. of 1 per cent. solution of the pepsin to be tested in 0.05 N hydrochloric acid. The time from the beginning of the addition of pepsin until the protein is completely liquefied is noted. If the volume of subtrate is represented by s, and the time of digestion by t, then t/s is nearly constant. It is better to adopt the mean t/s for all tubes as the constant. The comparison of the proteolytic activity of different pepsins resolves itself into a comparison of the constants thus obtained.—*J. Biol. Chem.*, 46 (1921): 119; through *Journ. Frank. Inst.*

Rapid Detection of Morphine in the Toxicological Analysis of Viscera.—By means of the following method morphine was detected in the viscera after ingestion by the subject of only 0.002 gram. One hundred and twenty grams of viscera are mixed with magnesia to a compact paste, which is completely dehydrated on the water bath. The powdered residue is boiled with acetone, and the filtered extract treated with 2-3 cc. of water and a few drops of acetic acid. The liquid is again filtered and evaporated on the water bath. The residue containing the morphine is purified by treatment with 5% acetic acid, filtration, and extraction with boiling chloroform, after addition of excess of ammonia.—Through the *Pract. Druggist.*

Constituents of Siam Benzoin.—The author has isolated *d*-siaresinolic acid by treating the crude benzoin with aqueous solution of sodium hydroxide (4-5 per cent.), and recrystallizing the sodium d-siaresinolate from alcohol. The free acid has a specific rotation at 25° of + 37.793 in alcoholic solution, and melts at 260° C. It does not contain a methyl group, and plays no part in the gradual discoloration suffered by the resin when preserved. The potassium salt crystallizes in needles, which dissolve freely in water and alcohol. The name *l*-prabangic acid is proposed for the substance $C_{27}H_{40}O_4$ isolated by Zinke and Lieb by the oxidation of *d*-siaresinolic acid by chromic acid in acetic acid solution. Lubanyl benzoate is described by the same author as the substance which exhibits a series of color changes analogous to those shown by the crude resin. It crystallizes in plates melting at 72.8° C., and contains one methoxy group. It readily loses benzoic acid when heated to 120°-140° C., and on further rise of temperature emits and an odor of carnations and subsequently of guaiacol. It is optically inactive. The benzoate is very readily hydrolyzed either in acid or alkaline solution, but the isolation of lubanol itself in the pure condition has been impossible owing to its susceptibility to change. Lubanol is probably identical with, or closely related to, coniferyl alcohol.—Reinitzer, *Archiv. Pharm.*, 1921, 259, 1-6, 60-69; through *Pharm. Journ. and Pharm.*, June, 1921.

Volatile Oil of Pimenta Jamaicensis (Amomis Jamaicensis).—The oil derived from the leaves of the wild pimento of Jamaica have been investigated by the author. It has an odor resembling

that of spike lavender oil, and is pale yellow in color. The leaves yielded 0.49 per cent. of volatile oil, having the following constants:

Specific gravity (15° C.)	0.8895
Optical rotation (22°)	6°
Refractive index (20°)	1.471
Acid value	2.4
Ester value	4.2
Ester value after acetylation	129.4

It was soluble in 2.5 volumes of 70 per cent. alcohol at 15° C., becoming cloudy with 6 volumes. Traces of caproic and acetic acids were found and about 0.1 per cent. of an aldehyde, which was not identified. A phenol was extracted which amounted to about 0.1 per cent. of the original oil. It gave a reddish-violet coloration with ferric chloride, but no evidence of the presence of eugenol was obtained. On fractionation about 15 per cent. of cineol was obtained, which gave an iodole compound melting with decomposition at 116° C. Two terpenes were separated, one giving the characteristic nitrite of α-phellandrene, melting at 112-113° C.; the other furnished a tetrabromide, melting at 124° C., indicating the presence of dipentene, From the fraction boiling at 190-205° a liquid having the odor and characters of linalool was obtained, which on oxidation with chromic acid yielded citral. Geraniol was isolated from the fraction boiling at 220-235°, which was identified by conversion into the acid phthalic ester, and by oxidation to citral. The diphenylurethane, melting at 80-81°, was also prepared. The last fraction boiling above 235° was brown and rather viscous. By distillation over sodium under reduced pressure a colorless oil was obtained having a specific gravity of 0.9320 and boiling between 245-290°, but the amount of oil was too small to permit further investigation of this product, which probably contained sesquiterpenes. The composition of this oil is, therefore, quite different from the oils of Pimenta species previously examined, which include oil of pimento fruits, from *Pimenta officinalis,* oil of bay leaves, from *Pimenta acris,* and two varieties of *P. acris,* one containing citral and the other having a characteristic odor of anise.—O. D. Roberts, *Journ. Soc. Chem. Ind.,* 40, 9, 491; through *Pharm. Journ. and Pharm.,* June, 1921.

MEDICAL AND PHARMACEUTICAL NOTES

FORMALINE IN URINE.—Dr. E. Pittarelli (*Lancet,* II., 1920, p. 1267) recently described a test for formaline in urine. The practical application is as follows: To 25-30 cc. of urine (acid or made acid) 10-12 drops of a 1 per cent. solution of phenylhydrazine is added and the mixture heated to boiling. After a few minutes 5-6 drops of a 1 per cent. solution of metol and 3-4 drops of a 25 per cent. solution of caustic soda are added, when a crimson color is produced, which, on the addition of magnesic salt, assumes a decided purple color. The crimson is stated to be appreciable to a 1 in 100,000 solution of formalin, and the purple tint increases the sensibility still further.—Through *Chem. and Drug.,* June, 1921.

TREATMENT OF POISON OAK DERMATITIS.—Alderson and Pruett report thirty-four cases in which treatment consisted of the injection of 1 cc. poison oak extract into the gluteus or deltoid. Almost invariably one intramuscular injection is followed by great relief of the local symptoms; swelling and itching particularly begin to subside within twenty-four hours. There is not much local irritation as a rule, but at times where some of the fluid has worked its way along the track of the needle, a painful indurated nodule appears and is slow in subsiding. Some of the patients seem to have become immune.—*Cal. State Journ. of Med.,* through *Journ. A. M. A.,* June, 1921.

PREPARATION OF STERILE IODOFORM EMULSIONS.—According to Blomberg, sterile and stable iodoform emulsions may be made by the following method: Cover two portions (60 and 40 gm.) of iodoform with 20 and 25 cc. respectively of an ethyl alcohol and ether mixture containing 4 parts of ether to 1 of alcohol. Let this mixture stand in the dark for 12 hours and then evaporate in a vacuum desiccator. Dissolve the 40 gm. portion in a liter of sterile olive oil at 55° C. Grind the 60 gm. portion as finely as possible in a sterile mortar. Add it to the solution and shake thoroughly. No crystalline iodoform will precipitate from this emulsion.—*Pharm. Weekblad,* through *Chem. Abs.*

BLACK DRAUGHT.—One of the earliest of the popular laxative potions was devised by Mannagetta, an Italian physician, at the court of the Emperor Rudolph II, about 1600. His prescription became popular under the title of aqua or potio laxativa viennencis and was popularly known in Germany as "Wiener Trank." The formula called for 1 ounce of senna, 6 drams of currants, 2 drams of coriander seeds, and 2½ drams of cream of tartar. These ingredients were packed in a bag and suspended in hot water for a night. In the morning the liquor was strained off and 5 ounces of manna and 2 drams of cream of tartar added. The dose was from 3 to 4 ounces. Various modifications of this appeared in the various formularies, the juice and peel of lemon being included in some. According to Wooton the term "black draught" first appeared in Paris' "Pharmacologie" in 1824. In Brande's "Materia Medica and Pharmacy" in 1839 the term "black dose" was given. In 1885 the synonym "black draught" appeared. Dorvault in his "L'Officine" gives the formula for a compound senna mixture under the title of "Potion Noire Anglaise."—Through the *Merrell Messenger.*

OIL OF BRICKS.—In the earlier pharmacopœias of London and Edinburgh, as well as in several other pharmacopœias of the eighteenth century a formula was given for the preparation of "oil of bricks." According to the London Pharmacopœia of 1746 we are told to heat bricks red hot and quench them in olive oil until they had soaked up all the oil. They were then broken up into small pieces, put into a retort, heated on a sandbath and distilled, producing a mixture of empyreumatic oil and water which was known as oil of bricks, oleum sanctum, oleum divinum, and oleum benedictum. —The *Merrell Menssenger.*

SOLVENT FOR ACETYL-SALICYLIC ACID.—Acetyl-salicylic acid (aspirin) is practically insoluble in water, and though soluble in alcohol such a solution is not generally suitable for administration. It is therefore usually given in tablets or cachets. Solution may be effected by addition of sodium bicarbonate, but as the resulting solution is merely a mixture of sodium acetate and sodium salicylate, this method is not admissible. It is said that sodium citrate will dissolve acetyl-salicylic acid without dissociation: for each grain of

aspirin 4 grains of sodium citrate should be added. Such a solution, flavored with syrup of lemon, is suitable for administration to children. Through the *Prescriber,* June, 1921.

FOODS AND VITAMINES.—The recent study of the vitamines has modified our conception of what a perfect food should be. From a chemical point of view it should provide sufficient calories to maintain the warmth of the body, and produce energy and also sufficient salts and proteins to furnish an adequate proportion of the various indispensable amino-acids. Biologically it should contain a sufficient amount of vitamines to ensure growth in the young and equilibrium in the adult. Physically is should contain cellulose corresponding in volume to the length of the intestine. The authors have examined a number of advertised foods, and found that many fall short of these requirements. White rats were employed as test animals. Five advertised infants' foods were insufficient to maintain life, and the rats fed on them exclusively died in periods varying from ten to forty days. Other foods had the same result, but maintained life longer; while others, again, maintained life, but were insufficient to allow of growth. Perrot and Lecoq consider their experiments prove that it is quite possible to produce foods that are not devoid of any one of the essential ingredients; in fact, three of those examined were of this nature. Manufacturers should have their foods tested, and remedy any deficiences that may be shown to exist. Cereal porteins can be improved by the addition of animal proteins; the necessary ions which are often deficient are sodium, calcium, and chlorine; milk, eggs, beer yeast, cereal germs, etc., may be utilized as a source of vitamines.—Em. Perrot and R. Lecoq, *Bull. des Sciences Pharm.,* 28, 177; through *Pharm. Journ. and Pharm.,* June, 1921.

ATROPINE SULPHATE FROM DATURA STRAMONIUM.—The authors have prepared atropine sulphate in crystalline form from stramonium herb by the following method: The ground plant was extracted with water containing 0.2 per cent. of sulphuric acid and 0.5 per cent. of formaldehyde; the percolate was treated with Fuller's earth, allowed to settle, and the sludge collected and dried at 50° C. The absorbed alkaloids were extrated with alcohol, using lime to obtain alkalinity; the extracts were acidified with acetic acid and concentrated first to 12 per cent. and then under reduced pressure to 2

per cent. of the original volume. This treatment was sufficient to convert all the hyoscyamine present into atropine. The solution was then rendered ammoniacal, the solution neutralized with sulphuric acid, evaporated to a syrup, and the latter while hot treated with acetone until precipitation almost commenced; on cooling atropine sulphate crystallized out.—Rhodehanel and Stuart, *Journ. Ind. and Eng. Chem.*, 1921, 13, 218-220.

RESISTANCE OF ACONITINE TO PUTREFACTION.—A rat was killed by the subcutaneous injection of 2 mgms. of aconitine. The carcase was left to putrefy for several days in the air, then enclosed in a metal box, and buried for two months. The pulped viscera were then extracted with absolute alcohol, acidified with 10 per cent. of tartaric acid, and kept at 60° for fifteen minutes. The cooled liquid was filtered and distilled in vacuo. This extraction was twice repeated. The final residual extract was dissolved in water and filtered. It was then shaken out with ether while still acid. The ether was removed, and the aqueous portion was rendered faintly alkaline with sodium bicarbonate, and again shaken out with ether and with chloroform. The last extract was evaporated, and the residue dissolved in 10 per cent. acetic acid. This solution gave positive reactions with Mayer's and Nonti's reagents, had the characteristic numbing action on the tongue, and gave a violet color with a 4 per cent. solution of sodium phosphate in molybdic acid. No reaction for ptomaine was obtained by Brouardel and Boutmy's test. It is therefore concluded that aconitine is not destroyed by flood ferments; that it resists putrefaction for two months; that weak acids and alkalies should be used for its extraction; that it can then be characterized by the organoleptic test and by the phosphomolybdic color reaction. It is stated that crystalline aconitine gives no violet reaction with ordinary phosphoric acid, either hot or cold.—*Austra. Journ. of Pharm.*, April, 1921.

SELECTED FROM AN ARTICLE ON DISPENSING IN THE PHARMACEUTICAL JOURNAL AND PHARMACIST, MARCH, 1921, BY A. B. GILMOUR.

A. B. C. LINIMENT.

With regard to A. B. C. Liniment, chemists frequently note on the prescription that for Lin. A. B. C. they have dispensed the British

Pharmaceutical Codex preparation, while others have noted that they dispensed the Royal Infirmary, Edinburgh, Pharmacopœia preparation.

A. B. C. Liniment is a synonym for the British Pharmaceutical Codex preparation Linimentum Aconiti Compositum, and is composed of:

Liniment of Aconite	2 parts
Liniment of Belladonna	2 parts
Chloroform	1 part

The British Pharmaceutical Codex states that this recipe is an improvement upon the forms of A. B. C. Liniment containing oil.

The Edinburgh Royal Infirmary Pharmacopœia Linimentum A. B. C. is composed of equal parts of Aconite Liniment, Belladonna Liniment, and Chloroform Liniment, and the recipe is the same as that stated in Martindale as being used in Guy's Hospital.

Martindale notes that while the olive oil in the Chloroform Liniment is not soluble in the other liniments, it is useful as a lubricant.

THE THREE SYRUPS.

As regards the three syrups:

The B. P. C. recipe is the same as that given in Martindale, and is equal parts of—

Syr. Ferri Phos. Co. c. Quin. et Strych.
Syr. Hypo. Co.
Syr. Ferri Phos. Co.

The Edinburgh Royal Infirmary recipe is:

Syr. Ferri Phos. Co. c. Quin. et Strych	1 part
Syr. Hypo. Co.	1 part
Syr. Ferri Phos. Co.	2 parts

The recipe in the Pharmaceutical formulas is the same as the Edinburgh Royal Infirmary recipe, and it is interesting to note that two well-known makers of proprietary tablets also adopt the Edinburgh Royal Infirmary recipe.

LOTIO CALAMINÆ.

The B. P. C. Recipe.

Prepared Calamine	44 grains
Zinc Oxide	22 grains
Glycerin	24 minims
Diluted Rose Water to	1 ounce

Edinburgh Royal Hospital for Sick Children.

Prepared Calamine	80 grains
Zinc Oxide	40 grains
Glycerin	10 minims
Boric Acid	16 grains
Distilled Water to	1 ounce

Royal Infirmary, Aberdeen.

Prepared Calamine	30 grains
Zinc Oxide	30 grains
Starch	30 grains
Glycerin	60 minims
Water to	1 ounce

LOTIO PLUMBI CUM OPIO.

The B. P. C. Recipe.

Tincture of Opium	24 minims
Lead Lotion to	1 ounce

Edinburgh Royal Infirmary.

Lead Acetate	4 grains
Opium in powder	4 grains
Distilled Water to	1 ounce

Edinburgh Royal Hospital for Sick Children.

Lead Acetate	4 grains
Opium in powder	4 grains
Diluted Acetic Acid	4 minims
Water to	1 ounce

Aberdeen Royal Infirmary.

Lead Acetate	4 grains
Tincture of Opium	15 minims
Water to	1 ounce

In the 17th Edition of Martindale's "Extra Pharmacopœia" the recipe for Lotio Plumbi et Opii is three minims of Tincture of Opium to one ounce of Dilute Lead Acetate Solution.

For Lotio Plumbi cum Opio chemists have also written on the prescription form the recipe which they dispensed, and the strength of both the Tincture of Opium and the Solution of Subacetate of Lead has varied as between chemist and chemist and the other recipes referred to.

LOTIO RUBRA.

The B. P. C. Recipe.

Zinc Sulph.	2 grains
Tr. Lavand. Co.	10 minims
Water to	1 ounce

Aberdeen Royal Infirmary.

Zinc Sulph.	3 grains
Tr. Lavand. Co.	10 minims
Water to	1 ounce

Edinburgh Sick Children's Hospital.

Zinc Sulph.	2 grains
Tinct. Cocci	2 minims
Water to	1 ounce

Aberdeen Royal Infirmary.

Zinc Sulph.	1 grain
Tr. Lavand. Co.	15 minims
Water to	1 ounce

MISTURA ALBA.

The B. P. C. Recipe.

Mag. Carb. Lev.	10 grains
Mag. Sulph.	60 grains
Aq. Menth. Pip. to	1 ounce

Edinburgh Royal Infirmary.

Mag. Carb. Lev.	15 grains
Mag. Sulph.	40 grains
Aq. Menth. Pip. to	1 ounce

Aberdeen Royal Infirmary.

Mag. Carb. Pond.	10 grains
Mag. Sulph.	80 grains
Tr. Zingib.	10 minims
Water to	1 ounce

Martindale.

Mag. Carb.	15 grains
Mag. Sulph.	30 grains
Aq. M. P. to	1 ounce

Squire.

Mag. Carb.	10 grains
Mag. Sulph.	1 drachm
Aq. M. P. to	1 ounce

In connection with the recipe in Squire's Companion, the statement is made that that recipe is given in several hospital Pharmacopœias.

MISTURA AMMINIÆ CUM SENEGA.

The B. P. C. Recipe.

Carbonate of Ammonia	4 grains
Ipecac. Wine	10 minims
Inf. Senega	½ ounce
Water to	1 ounce

Royal Infirmary, Edinburgh.

Mistura Ammonii et Senegæ Composita.

Carbonate of Ammonia	10 grains
Comp. Tincture of Camphor	40 minims
Spirit of Chloroform	40 minims
Infusion of Senega to	1 ounce

Recipe Dispensed by Chemist.

Carbonate of Ammonia	10 grains
Spirit of Chloroform	10 minims
Bromide of Ammonia	15 grains
Antimonial Wine	20 minims
Syrup of Tolu	40 minims
Infusion of Senega to	1 ounce

The recipe in the British Pharmaceutical Codex is the same as the St. Thomas's Hospital recipe which is quoted in Squire's Companion.

MISTURA BISMUTHI CUM SODA.

The B. P. C. Recipe.

Sodium Bicarbonate	10 grains
Bismuth Mixture to	1 ounce
Glycerin of Bismuth Carbonate	30 minims
Water to	1 ounce

Edinburgh Royal Infirmary.

Bismuth Oxycarbonate	20 grains
Sodium Bicarbonate	20 grains
Glycerin	80 minims
Diluted Hydrocyanic Acid	5 minims
Comp. Tincture of Cardamoms	40 minims
Distilled Water to	1 ounce

MIST. RHEI CUM SODA.

The B. P. C. Recipe.

Powdered Rhubarb	5 grains
Bicarbonate of Soda	10 grains
Caraway Water to	1 ounce

Recipes Dispensed by Chemists.

(1)

Powdered Rhubarb	4 grains
Bicarbonate of Soda	20 grains
Carbonate of Ammonia	6 grains
Spirit of Chloroform	20 minims
Infusion of Gentian to	1 ounce

(2)

Comp. Rhubarb Powder	7½	grains
Bicarbonate of Soda	18¾	grains
Glycerin	1	drachm
Cinnamon Water .....to	1	ounce

(3)

Comp. Rhubarb Powder	11¼	grains
Bicarbonate of Soda	15	grains
Spirit of Chloroform	15	minims
Glycerin	30	minims
Peppermint Water .....to	1	ounce

The recipe in the British Pharmaceutical Codex is the same as the St. Thomas's Hospital recipe, which is quoted in Squire's Companion.

MIST. RHEI CO.

The Edinburgh Royal Infirmary Recipe.

Sulphate of Magnesia	40	grains
Tincture of Rhubarb	80	minims
Syrup of Ginger	40	minims
Distilled Water .....to	1	ounce

Recipe Dispensed by a Chemist.

Compound Tincture of Rhubarb	30	minims
Bicarbonate of Soda	22½	grains
Glycerin	30	minims
Peppermint Water .....to	1	ounce

UNGUENTUM ATROPINÆ.

With regard to Unguentum Atropinæ, I submit three prescriptions—

(1)

Atropine Ointment	1	ounce

Directions. The ointment.

(2)

Atropine Ointment	½	ounce

No directions were given.

A chemist supplied the following recipe:

Red Oxide of Mercury	2 grains
Atropine	½ grain
Lard	2 drachms
Soft Paraffin	2 drachms

(3)

Atropine Ointment	1 ounce

Directions. Ointment for Eye.
Use three times a day.

SELECTED FROM AN ARTICLE ON DISPENSING IN THE BRITISH AND COLONIAL PHARMACIST, MARCH, 1921, BY HAROLD WYATT.

Foreign Prescriptions, though not of daily occurrence, are frequently handled in a great seaport town like Liverpool, and present difficulties mainly due to the language in which they are written or the preparations they call for:

American.—

Olei olivarum	℥ iij.
Glycerini	℥ v.
Fluidi extracti senegæ	℥ iv.
Fluidi extracti pruni virginianæ	℥ vi.
Fluidi extracti glycyrrhizæ	℥ iv.
Spiritus vini gallici ad	℥ iv.

Fiat linctus.

This was dispensed minus the last ingredient, the owner being told to add this himself, a thing, as he said, he would scarcely have been able to do in "God's own country," owing to his countrymen's temperance notions.

	Grammes.
Acidi arseniosi	.25
Strychninæ sulphatis	.20
Aloini	1.25
Pepsini (scales)	8.
Ferri redacti	10.
Quininæ bisulph.	10.

M. ft. capsulæ No. 100.

This is an illustration of the variety met with in American prescriptions and the number of capsules, etc., ordered.

Scandinavian scripts are usual, and as they are written in Latin, and usually in very good and legible caligraphy, they are easy to make out.

Danish.—

	Gramm.
Bromidi natrici Tinctura valerianæ .....āā	15.
Phosphatis natrici	10.
Aquæ .....ad	300.

1 spisestre 3-4 gauge i dögnet.

(℥ ss. three or four times a day.)

	Gramm.
Aqua ophthalmicæ boratæ	300

Fiat solutio.

This is sodii biboratis gr. 3.

Aquæ fœniculi gr. 297.

French.—

This one typical example of French prescribing in general will give a notion of what is ordinary.

	Grammes.
Benzoate de soude	2.
Terpene	1.
Sirop codeine	30.
*Eau de laurier cerise	15.
†Julep gommeux	150.
‡Teinture d'aconit	xxx gouttes

Faire deaux fois cette potion. (Send double this quantity.)

NOTE.—All ingredients in French prescriptions are weighed, liquids and solids, unless otherwise stated.

*Cherry laurel water is often used in cough mixtures in France for the flavour mainly and also as a sedative.

†Julep gommeux, or potion gommeuse, consists of orange flower water, gum acacia, and syrup, see "B. P. C." and also "Squire."

‡Tincture of aconite 30 drops means 30 drops measured by a calibrated pipette, such as is ordered in the French Codex.

Italian.—

Solfato di zinco
centigrammi dieci
Cloridrato di cocaina
centigrammi dieci
Acqua destillata é
sterilizzata
grammi quindici

Fare collirio.

Dare schizzetta conto gocce.

	Grammis.
Zinci sulph.	.10
Cocainæ hydroch.	.10
Aquæ destillatæ (sterilised)	15.

Fiat collyrium.

Send an eye dropper.

Italian.—

Cianuro di idrargirico
centigrammi venti
Acqua distillata é
sterilizzata
grammi mille

Per lavature occulari

	Grammes.
Hydrarg bicyanidi	.20
Aquæ distillatæ (sterilised)	1,000.

The eye wash.

The direction as to sterilising the water seems somewhat unnecsary in the presence of such a strong bactericide as mercuric cyanide.

Russian Prescriptions are invariably written in Latin—

Salis Pelletieri	0.5
Thiocol	0.1
Butyri cacao	1.5

Fiat globulus mitte 12.

These pessaries were easy to make, but the identity of Pelletier's Salt was somewhat obscure. Examination of a pessary revealed the presence of a quinine salt, and therefore the soluble hydrochloride was used.

Spanish Prescriptions are usually written in Spanish, though at times one finds one in Latin. It is remarkable that the Latin nations seem to have almost entirely discarded the use of that language in prescriptions, which is to be deplored from every point of view:

	Gramos.
Glicerofosfato de cal	0.30
de sosa	0.20
de hierro	0.15
Polvo di paulinia	0.25

Hacer polvo.

	Grammes.
Calcii glyceroph.	.30
Sodii "	.20
Ferri "	.15
Pulvi guarana	.25

Fiat pulvis.

Bromuro de potaso	10.00
de sosa	10.00
de amonio	10.00
Jarabe C. N. A.	150.00

Hacer bebida.

Tomese una eucharada de las de sopa al acostarsi y repitase si sea necesario.

Potass. brom.	
Sodii brom.	
Ammonii brom.	āā 10 grammes
Syrupi aurantii	150.

Fiat mistura.

One tablespoonful at bedtime and repeat if required.

The contraction jarabe C. N. A. expanded is jarabe de corteza de naranja amarga syrup of bitter orange peel.

	Gramos.
Aceite de almendras	60.
Amoniaco puro	5.

Remedio para sabañones.

Oil of almonds	60 grammes
Ammonia liquid	5.

Chilblain Remedy.

Swiss.—

Guaiacol	0.05
Camphoræ	0.10
Iodoformi	0.01
Eucalptol	0.05

Fiat ampulla mitte xx.

These were simple to make, and were sent out made up to 1 cc. each with sterilised almond oil.

Roumania.—These are mostly written in French—at any rate, those we get from Roumanian ports—are of a distinctly French character, containing plenty of syrups and medicated wines, caffeine and glycerophosphates, as in the following example:

	Grammes.
Vin de quinquina	200
Vin de malaga	150
Glicerina neutra	150

	Centigrammes.
Arsenit de sodii	.10
Glicerofosfat de calce	10.
Tra nuca vomica, Kola, Koka	āā 5.

NEWS ITEMS AND PERSONAL NOTES

A GRANT FOR RESEARCH.—The American Pharmaceutical Association has available a sum amounting to about $360, which will be expended after October 1, 1921, for the encouragement of research.

Investigators desiring financial aid in their work will communicate before September 1st with Prof. H. V. Arny, Chairman A. Ph. A. Research Committee, 115 West Sixty-eighth Street, New York, giving their past record and outlining the particular line of work for which the grant is desired.

PHILADELPHIA COLLEGE OF PHARMACY AND SCIENCE NOW HAS BOTANIC GARDEN.—At a meeting of the Philadelphia College of Pharmacy, held on June 27th, a resolution was adopted, by a standing vote, to accept the offer of the H. K. Mulford Company of the use of a tract of land adjoining the Mulford Biological Laboratories, Glenolden, as a botanical garden.

The site is ideal for the purpose, lying as it does in the Valley of the Delaware, the soil and climatic conditions being especially favorable to the cultivation of medicinal plants.

Adjoining the original house on the grounds, which is a relic of Colonial times, is an old-fashioned garden, which is devoted to the cultivation of medicinal plants. This will be reserved for the College, as well as an open tract of land and a section of woodland so that the plants requiring partial shade, such as Aconite, Golden Seal, etc., can be cultivated.

In addition, the College will have the use of the greenhouse, implements, plant materials, hot and cold frames of the Mulford Company, who will also undertake the rough work such as the ploughing and preparation of the soil.

The direction of the work will be under Prof. H. W. Youngken, who will have the collaboration of Dr. Githens, Chief Botanist of the H. K. Mulford Company.

This department will be known as the Botanic Garden of the Philadelphia College of Pharmacy and Science, and will add greatly to the scope of that institution in giving practical training on botany, particularly as applied to medicinal plants,

DR. ROBERT P. FISCHELIS IS ELECTED DEAN OF THE NEW JERSEY COLLEGE OF PHARMACY.—At a meeting of the Board of Trustees of the New Jersey College of Pharmacy held June 29, 1921, Dr. Robert P. Fischelis was unanimously elected Dean and Professor of Practical and Commercial Pharmacy in that institution. He succeeds Dr. P. E. Hommell who has been made Dean Emeritus, and who will continue as Professor of Materia Medica, Botany and Physiology.

Dr. Fischelis will continue his work as a consulting chemist with offices in the Metropolitan Building, New York City, and will probably continue his lectures on Commercial Pharmacy in the Philadelphia College of Pharmacy and Science, with whose faculty he has been associated since the merger of the Medicochirurgical College Pharmacy Department with the Philadelphia College of Pharmacy and Science.

BOOK REVIEWS

"THE ELEMENTS OF VEGETABLE HISTOLOGY." By C. W. BALLARD. John Wiley & Sons, Inc., New York, 1921; 46 pp., 75 illustrations.

The text covers to some extent the subject of microtechnique (involving the principles of infiltration, cutting, staining, etc.), the microscope, the plant cell and its contents, the covering supporting and conducting tissues and the tissues of synthesis. There also appear chapters on the root, stem, leaf, flower, fruit and seed. At the rear of the volume is a chapter on the various accessories of the microscope such as the mechanical stage the occular micrometer, the camera lucida, etc., and lastly, there follows an appendix of formulæ, table of magnifications, etc.

The text shows a number of weaknesses. In the first place, there is a lack of clarity on certain points. Second, there is a dearth of suitable pharmacognostical illustrations and references. And finally many of the illustrations present (excepting those which have been

borrowed) are of too poor a quality to occupy the positions they hold.

On the other hand the simplicity of style is much in favor of the beginner who will not be burdened by the intricacies of so vast and difficult a field as botany. The author has, however, in trying to reduce facts to their lowest terms, here and there sacrificed comprehensive understanding for brevity.

At the present time, therefore, it seems that while the book is not as valuable as some, it should, nevertheless, serve as a nucleus for greater achievement.

M. S. DUNN.

"ANALYST'S LABORATORY COMPANION." By ALFRED E. JOHNSON, B. Sc. Lond. Fifth Edition. P. Blakiston's Son & Co., Philadelphia, publishers; 176 pages. Price, $3.50 net.

This book, as the title would indicate, is intended as an aid to the laboratory worker. In this edition the author has enlarged upon and revised several of the important features of previous editions and presents to the analyst a valuable and up-to-date collection of tables and data.

When one considers that about seventy separate headings are listed among the contents of this little volume he realizes how compact and concise a book of this size must be. Practically all of the more important and useful tables that are required in laboratory routine are given. Among these are tables of the international atomic weights for 1921, logarithms, densities of gases, gravimetric and volumetric factors, corrections for volumes of gases, volume and density of water at different temperatures, Baume's hydrometers, strength of hydrochloric, nitric and sulphuric acids of different densities, tables required for water analysis, for phosphates, for the conversion of nitrogen into ammonia, for the Kjeldahl process, thermometric tables, alcoholometric tables and tables of constants for oils, fats and waxes. There are also useful tables on freezing mixtures, melting points of metals, reciprocals of numbers, percentage compositions of commonly occurring compounds with formulæ and molecular weights, densities of elements and common substances,

strengths of saturated solutions of some of the common salts, beer analysis, the specific rotary power of carbohydrates, milk analysis, and a table showing the percentage of chicory with coffee from the percentage of aqueous extract.

In addition to these several explanatory notes are given on volumetric solutions, logarithms, computation, approximations, indirect analysis, alcoholometry, food preservatives, electrical units and heat and thermo-chemistry.

A very interesting feature of the book is the presentation of several concise descriptions of analytical processes. For example, one section is devoted to the subject of water analysis, another to the cupric oxide reducing powers of the carbohydrates, another to beer analysis, and still another to the estimation of chicory in a mixture of chicory and coffee.

Considerable value is given to the book by the section on oils, fats and waxes, consisting of notes, tables and other data, as well as by the pages devoted to notes on the various indicators. Some space is given to the British regulations governing the sale of butter, margarine and milk, and, as might be expected in a book of this type, the subject of weights and measures is thoroughly taken up by the use of equivalents and methods of transposition.

With its wealth and selection of material this handy little book is bound to become a helpful companion to the laboratory worker and analyst.

E. J. Hughes.

Travaux du Laboratoire de Matière Médicale de La Faculté de Pharmacie de Paris. Vol. xii, 1920.

This work is divided into four parts: Part I comprises a report by Émile Perrot and Ad. Alland on Gum Arabic, Senna, and several other medicinal, edible and industrial products of the Anglo-Egyptian Soudan. The authors include in this splendid article their observations on the vegetation encountered on their trip from Cairo to Kordofan, a note on the principal exportations of vegetable products of the Anglo-Egyptian Soudan and comments on the economic prospects of this region. They have elaborately illustrated it with 44 fig-

ures of plants and scenes encountered on the trip along with a map of the Anglo-Egyptian Soudan.

Part II comprises a doctorate thesis written by François J. Doré, entitled "La Therapeutique et L'Hygiene en China" ("Therapeutics and Hygiene in China"). The author discusses the influence of superstitions in China on the development of the medico-pharmaceutical sciences of that country.

Part III is a treatise on "Composition Chimique du Bacille Tuberculeux" ("Chemical Composition of Bacillus Tuberculosis"), by A. Goris. In this article the author gives the history of the subject and then discusses the methods employed and results attained in his personal investigations. Both the organic and mineral constituents are described and observations recorded on the acid resistance of the organism.

Part IV comprises two articles. The first of these, by Professor Émile Perrot and G. Blaque, is entitled "Les efforts de l'étranger pour la production des drogues vegetales" ("Foreign efforts for the production of vegetable drugs") and treats of the recent work (up to 1920) in this direction in Germany, England, Canada, India, Austria, Belgium, United States, Holland, Dutch East Indies, Hungary, Italy, Poland and Russia. A bibliography of some of the recent literature bearing upon vegetable drug production accompanies the article.

The second article, by A. Goris and Ch. Vischniac, treats of the character and composition of primeverose from *Primula officinalis Jacquin.*

H. W. Y.

FRENCH-ENGLISH DICTIONARY FOR CHEMISTS. By AUSTIN PATTERSON, PH. D., formerly Editor of "Chemical Abstracts." John Wiley & Sons, Inc., New York, 1921; xvii+384 pages, 5 by 7 inches; $3.00 postpaid.

This book is a companion volume to the author's "German-English Dictionary for Chemists." As stated in the prospectus, "everything possible has been done to make the reader of chemical

literature independent of any other French dictionary." The book contains over 32,000 entries and covers the entire chemical field, as well as much that is pharmaceutical, medical and botanical. Also, all common general words which are likely to appear in scientific literature are defined. There is included a general statement covering the conjugation of French verbs and a series of notes intended to assist in the use of the vocabulary. In short, the general scheme is such that the book should be available even to those least familiar with the French language. While the book is intended primarily for the translation of French chemical literature, it should prove of service in the translation of pharmaceutical literature as well.

R. R. F.